FOOD INDUSTRIES

NOV 6 1940

HOMES OF FAMOUS FOODS . . . WORCESTER SALT REFINERY, SILVER SPRINGS, N. Y.

IN THIS ISSUE:

32 Inventions Needed in the Food Industries

The Value of Treated Spices in Foods

Packaging for Plus Sales and Prestige

How To Organize Research for Profit

Basic Food Plant Operations Improved

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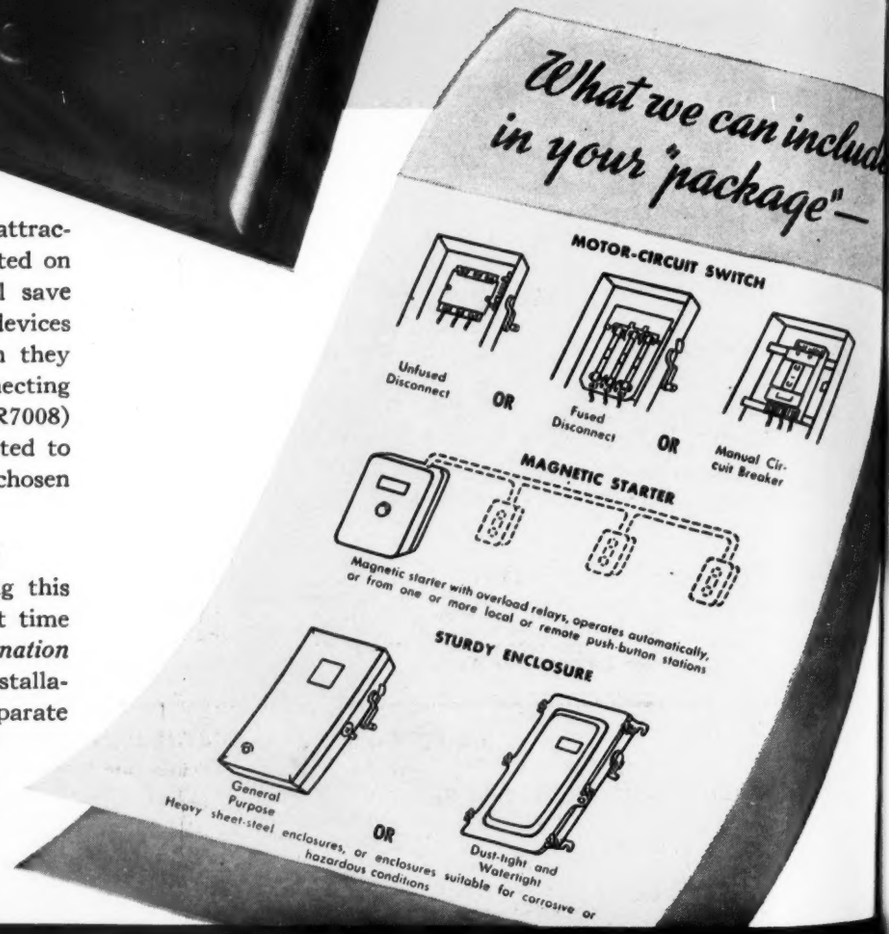
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In THIS *Issue*

• FOOD PROFITS THROUGH INVENTION

Tom Marshall once said, "What this country needs is a good five-cent cigar." Now, 1,042 leading American industrialists point out that what American industry needs is some new inventions. This fact was brought out in a survey by The Research Advisory Service. Among the needed inventions are 32 in the field of food processing. Page 35.

Invention, today, is not often the sudden inspiration of a single brilliant mind. It is rather the result of painstaking effort carried out by well-organized research laboratories. How such a laboratory can be organized and then managed to bring a profit is a problem. How General Foods Corp. solved this problem is told on page 29 by Thomas M. Rector, head of the new Central Laboratories in Hoboken, N. J.

• IDEAS FOR THE TAKING

After analyzing its plant operations with a cold, critical eye, California Walnut Growers Association decided there was room for improvement. And improvements were made—in handling, sorting, separating and inspecting, operations common to many food factories. So if you haven't ever looked at your plant operations with as detached and critical an attitude as if you were examining a dead fish, you better turn to page 32. Robert G. Engel, who helped develop the improvements, tells all about them.

• PLUS PACKAGING

Some foods can't crash the mass market. These must be packaged to qualify for the patronage of a narrower selective market. Then there are still other occasions for special packaging. There is packaging to induce purchase of assortments, packaging for safe delivery of direct-by-mail purchases and packaging for such purposes as gifts for building good will. On pages 46 to 48 you will see successful special packages illustrated and their uses described. These are food packages which have proved their selling power in actual service.

• GOOD NEWS FOR SPICE USERS

On pages 428 to 431 of Food Industries for August, 1938, was told the result of a method by which spices are sterilized through fumigation with ethylene oxide. At that time the process was so new that it was not known how well the sterilized spices would keep—whether or not they would become recontaminated during normal shelf-life. This question is now answered. Tests show definite benefits from the sterilization process. The story, by H. W. Smith, bacteriologist, appears on page 52.

In FORTHCOMING *Issues*

• LUXURY FOR OYSTERS

Everyone knows that oysters are found in beds—the luxurious creatures. But their treatment by shellfish packers, after their forceable removal from these beds, has often lacked that same degree of luxury. Now General Foods Corp. has come to the aid of the oyster and erected a new oyster packing plant at Greenport, N. Y., which is the last word in oyster treatment. The outstanding features will be described and pictured soon in Food Industries.

• AID FOR LIFE SAVERS

Three years ago Life Savers Corp. started something. The company developed a fetching new assortment package as a gift offered to stockholders at Christmas. Only a few packages were made up, and the demand was much greater than expected. Next year the order was stepped up and the packages put on sale in a few retail outlets. This year 100,000 retail outlets are selling the assortment. This highly successful special food package will be described and illustrated soon.

• NEW PUBLIC RELATIONS TECHNIC

General Mills does many things for the welfare and peace of mind of its employees. So it has nothing to hide and everything to talk about. And talk it does. It holds regional meetings of stockholders and gets them out in droves. Then it lets them know all about the business. These stockholders become enthusiastic boosters. General Mills feels that this technic, if widely used by business, would bring about a better understanding between the 18,000,000 individuals who own American business and those who run it. The technic will be described in an early issue.

• THE FROZEN FOODS DIRECTORY

Everyone knows there's a frozen food industry, but few know what is taking place in that industry. In the December issue the Frozen Foods Directory will contain detailed information showing what freezers are doing in the way of production, freezing plant locations, products, containers, brand names and freezing systems. If you're a freezer don't forget to send in information on your operations so that you will be listed where buyers and distributors will find you.

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The Talk of the Industry

» A DRIVER-SALESMAN for a milk company that has just gone over to the new lightweight milk bottles with narrow mouths has confided to us that he does not like the new bottles, despite their great economy to the company and their lesser load on his own physique.

Reason: He can carry only three of the new bottles in each hand, whereas he could carry four of the older but heavier long necked affairs. This, he says, forces him to tote the bottle carrier and delays him a few seconds on each stop to carry that extra bottle. Therefore, he thinks, a trifling matter like the shortness of his own fingers tends to offset the economies of an improved package.

» NOW THAT the New York World's Fair has permanently closed, we hasten to award the palm to the most popular success of that two-year spectacle of superlatives. No, it wasn't General Motor's Futurama, it wasn't Borden's Elsie, it wasn't even Gypsy Rose Lee. Two years of careful observation brings the inescapable conclusion that more people found more

solid enjoyment in the unpretentious Child's frankfurter stands than in anything else they found at the Fair. The World of Tomorrow may fire our imaginations, but it was food that caught most of our dimes.

» WORD COMES from Washington that the plans for a heavy tank weigh nearly 200 lb. while the plans for a big battleship weigh about seven tons. Wonder how many pages of specifications are needed?

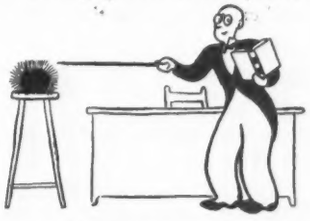
National defense requires the procurement of 2,250,000 different items, of which food is but a small detail, though a very important one. If rearmament is slow, there's a reason.

» IN THE LIGHT of the great increase in employment now taking place, especially in munitions centers, it would appear that local food manufacturers should profit greatly from the larger payrolls. Inquiry in a town where a huge munitions plant runs 24 hours a day and new additions are built as fast as more skilled employees can be found revealed, however, a strange situation. A large wholesale bakery has suffered a loss of 18 percent in dollar sales volume in the year from September, 1939, to September, 1940.

What does it mean? Only this: Some foxy, enterprising bakers from other nearby towns moved into the territory and grabbed not only all the new business but about one-fifth of the old business formerly held by the big fellow. The manager is now trying to recoup his lost volume by beating the bushes in a place more than 45 miles away.

Again the question is asked: What does it mean? The Board of Education is frantic trying to provide schools. Town traffic is so great that the main thoroughfare is being doubled in width. And the bakery loses 18 percent in volume where the estimated population is nearly doubled! Is it possible that the sales manager went to sleep? Or is it possible that somebody else's bread tastes better?

» LAST SUMMER the third annual school for mold counters was held at the New York State Agricultural Experiment Station in Geneva. This may sound funny to those not directly connected with the canning industry. But, among tomato canners, what with the F&DA recently announcing reduced mold count tolerances for tomato



products, skill in the technic of mold counting is of prime importance—not to be confused with such frivolous intellectual pursuits as the chemical analysis of the holes in Swiss cheese or the determination of the effective range of garlic.

» TO THOSE in the food business the stupendous size of the armament program is not easily apparent. Food manufacturers are not receiving orders that run into seven, eight and nine figures (unfilled orders for aircraft amount to better than $2,000,000,000). Yet there are certain signs that clearly portray only the beginning of a gi-

gantic effort in which the food industry will ultimately share.

One of the signs of the times that is easily followed is the number of ads for Help Wanted in a large metropolitan newspaper which really carries these ads in quantity, such as the *Chicago Daily News* or the *New York Times*. In the dark days of 1932 the Help Wanted—Male professional and commercial ads were down to a column and a quarter in the Sunday *New York Times*. During the peak of the 1937 boom, these columns of the Sunday *Times* reached a maximum of four and one-half to five columns. During the first half of 1940 they ran about four. On September 8 and 15 the paper required six columns to show the number of jobs open. On September 29 it was five columns. On October 6 and October 13 it was six columns again. These are the highest figures ever observed and cover only jobs—not "schools," house-to-house commission salesmen and similar miscellany.

Exemptions from the Draft

COMPULSORY military training under the new selective service law is a universal obligation. There are no exemptions, only deferments; and blanket deferments in any industry, no matter how important, are prohibited. Deferment is an individual matter that must be decided by the local draft board in each individual case. However, the guiding philosophy of the regulations laid down for local boards is that normal civilian economy and national defense procurement must not be interrupted.

Because deferment is only temporary, the obligation is placed upon the employer to arrange to replace eligible men who may be called but whose immediate departure would disrupt plant operations. This obligation increases in importance the lower the draft number of the employee. Finding and training a replacement for an employee whose number is tenth in the draft lottery is of much more immediate importance than if the number were the three-thousandth taken from the big glass bowl. Draft officials stress this employer obligation, urging that the problem be anticipated by means of plant surveys to determine which men in skilled jobs are of draft age and without dependents, so that steps may be taken to train others to handle their jobs.

In cases where deferment is requested from the local draft boards, there will be two important tests applied: First, is the employee engaged in an activity contributing in a useful or productive way to the well-being of the community or the nation; second, is he engaged in an activity essential to the national defense. To win deferment in either case, it must be affirmatively shown that the employee cannot be replaced and that his removal would cause an "effective loss to such activity."

These are the important conditions surrounding the drafting of skilled employees. The wise food manufacturer, not wishing to have his operations crippled, will plan to meet these conditions before they arise.

Axis-Japanese Pact Concerns Food Industry

TO ALL those incorrigible optimists who have serenely believed "It can't happen here" there is only one answer: It is now happening. The principal world sources of tin and rubber are placed in jeopardy by the new Axis pact with Tokio. To be sure, there are reserves of tin in the United States that will carry us on for about a year. And there are also lesser reserves of rubber that can be supplemented by synthetic rubber production.

Up to the very moment of outbreak of a war with Japan, should the unfortunate circumstance happen, our supplies will probably continue to arrive in increasing amounts. After that, further purchases of these materials would depend on the fortunes of war. Undoubtedly many shipments might get through despite the advent of hostilities. But the optimists who have been absolutely certain that these supplies will be readily available, no matter who is in control of the Far East, must now revise their estimates, for apparently none of them foresaw the new military alliance.

Without question, World War II is going to be a long war and in time many a food manufacturer will face production problems that will challenge his resourcefulness, whether the U.S. is a participant or not. It is doubtful, however, if many executives in the food field have thought their possible problems through, let alone appraised the nature of the problems they may eventually have to face. These will pertain to both packaging and distribution, as well as to processing.

Whether or not the United States is involved in hostilities from choice is beside the point. Wars have a habit nowadays of coming uninvited. And there is always the possibility of in-

Hors d'Oeuvres

• Bulls lacking in pep may recover it by having shot into them ascorbic acid (vitamin C) once every week or ten days. The dose is one gram per 1,000 lb. of body weight. Alas, it will not work when taken by mouth, so "Sunkist" cannot use it in their advertising.

• *Near beer is being manufactured in Munich as a substitute for the Germans' favorite beverage. The Nazis ought to call it "Dover"—near and yet so far.*

• A British bar hung this sign outside after a bombing raid:

Bombs have been near
But the beer is still clear
Business as usual
Be of good cheer.

People like that can't be licked—or they shouldn't.

• *A flashlight to clip to the pup's collar is a premium offer used by Swift to promote "Pard," its dog food. But our dog doesn't need a light. He can see a post two blocks away any night.*

• We take this tall story from the vacation travel edition of *Exide News:* "In Reno a woman started to run a steaming hot bath. But the weather was chilly and the water froze solid so fast that it was still hot an hour afterward." Maybe there's something here for the quick freezing industry to work on.

• *Donutty is a new party game conceived and promoted by the doughnut industry. The name describes it—you do nutty things, such as reciting a poem with a doughnut balanced on your nose. Well, they can't condemn a promotion man for trying.*

• Canned Pea Marketing Institute recently held a pea eating contest in which a knife was the only instrument. Unfortunately, this contest sponsored a method of eating peas which is poor etiquette. There were no mashed potatoes on the knife to keep the peas from spilling over the table.

• *They say nothing is more important to an army than food. Quite true. Yet, a soldier has no stomach for beans when his belly is full of bullets.*

• Green soybeans are a good source of protein, calcium, phosphorus, iron, potassium, magnesium, sulphur, copper and vitamins A, B, G and C. Too bad they aren't good to eat.

• *Glidden Co. recently served a guest luncheon with these items on the menu: Soy-carrot juice, soy-mince sandwich spread, soy soup, soy wafers, baked soybeans, soybean bread and butter, soy milk and soy ice cream. Soy what?*

F.K.L.

terference with our supplies by Japan as a method of impeding our aid to the British Empire. That there are ways to meet this threat to the normal functioning of the food industry is, of course, apparent to anyone who has given it much study.

At the present moment the real problem is to shake American business men out of their intellectual lethargy. Many a man has thought that adequate supplies are only a matter of paying a higher price. In normal times that would be true. But these are about the most abnormal times that anyone alive has ever known.

For decades on end American business has pursued the almighty dollar and has reasoned so long in terms of dollar prices that it is well nigh impossible to even contemplate any other form of price. There are, however, moral prices and political prices which must be paid by the nation as a whole, not by the individual business. And unless these other prices may be paid if the demand is inescapable, then the dollar price has very little significance. We must face the fact that whoever is in control of the principal tin and rubber resources of the world is in a position to demand political and moral prices as well as dollar prices, unless American business (and that includes the food industry) can meet the challenge if and when it comes and obviate the necessity of making concessions.

Just as munition workers in England are a vital part in the current battle of England, the technical resourcefulness of the food industry and those who supply it are likely to play an equally vital role in our future, particularly if the United States is to avoid actual participation in the fighting. The new Tokyo-Axis pact should serve to stimulate all concerned to do a lot of heavy thinking about their contribution to various means of avoiding any national necessity for payment of political and moral prices.

Defense and Tax Burdens

Now that the long-drawn-out discussion of the excess profits tax bill has been completed, and the bill passed and become law, it is evident that it is only a beginning in a program of increasing tax burdens that must accompany defense preparations. Study of the yields to be expected from the new tax, as made by the U.S. Treasury Department, indicates that it will not go far toward meeting the immense appropriations for defense already made and likely to continue for several years. On the basis of 1940 income estimates, the net yield of the new tax, when allowance is made for lowering of income tax yields caused by lower dividends, is expected by the Treasury to be not greatly in excess of $400 million.

While this is certainly not a pleasant prospect for any food manufacturer to contemplate, reflection will soon show that increased taxes now are better than deferring the whole cost of defense to a future date by means of bond issues. Under the stimulus of full employment and a high rate of business activity growing out of the defense program, bond issues are bound to have an inflationary effect. In contrast, high taxes are deflationary. Therefore, the tax increases already on the books and still to come will have a tendency to counterbalance the increased borrowing through government bonds that cannot be escaped. Anyone whose memory goes back to the disastrous inflations, particularly in Europe, that grew out of the policy of reckless borrowing pursued during World War I, will regard the present and forthcoming tax increases as the least dangerous course to follow.

As to the present bill, it is likely to cut rather heavily into the earnings of well-established food companies, though not so heavily as had been feared by many. Examples are available from a study of actual 1939 earnings and estimated 1940 earnings after excess profit tax payments, made by Hirsch, Lilienthal & Co. of New York. This shows $6.82 for Coca-Cola in 1939, against $6.43 in 1940; $1.81 for Borden in 1939 against $1.66 in 1940; $2.75 for General Foods in 1939 against $2.48 in 1940; and $1.68 for National Biscuit in 1939 against $1.54 in 1940.

Play Ball with Henderson On Prices

Mr. Leon Henderson of SEC and other New Deal activities is a man with whom business should be much better acquainted. His principal task today on the Advisory Commission to the Council of National Defense is to see that prices do not get out of hand or go up unwarrantedly. It is his duty to prevent a dull and sickening slump of prices after the current emergency is over. To accomplish this most effectively it is only necessary to prevent any runaway of prices such as existed in 1917–1919.

If more business executives knew him better and understood his reasons for disapproval of price hikes, there would be greater happiness all around. For Leon Henderson has more facts at his finger tips than most executives would give him credit for possessing.

It is his firm belief that Federal price controls should be avoided if possible, but he is prepared to recommend their imposition if need be to avoid a repetition of the 1920-1921 post war slump.

Despite his convictions on this score he recognizes the need for higher prices in certain isolated cases.

Cooperation of industry with this aspect of the defense program is just as important in the long run as cooperation in any aspect of rearmament.

Apparently the government is willing to pay a reasonable market price but is opposed to any price increases not justified by higher costs. Supply and demand are not to be considered if the government is the only buyer.

None of the foregoing has any present application to the food industry, but if price control is instituted there is no likelihood that food manufacturers will be exempted. Hence the need for cooperation all around.

Food Standards Suit

Again the Food and Drug Administration is confronted with a court action with respect to the sweetener controversy. One of the more ardent proponents of corn sirup as an ingredient of foods is demanding in the Circuit Court of Appeals at Chicago that the standard for sweetened condensed milk be modified for his benefit.

This suit is brought by A. E. Staley Manufacturing Co. in its own name. FSA is replying that a mere maker of an ingredient has no standing in court in such a case. This means that at first there will be a determination of legal technicalities, before the rights of the corn sirup maker are judged by the court on their technical merits.

Lay members of the food industry need not be discouraged by this situation even if the court should say that an ingredient manufacturer has no standing. Should the court take such position, supporting FSA's request, then the makers of ingredients will be only nominally excluded from direct action. They can come in again, as in this case, through any customer or prospective customer who wants to use their ingredient within a standard.

Noting this distinction between technicality and fundamental principle is important. It will be desirable for the court to rule on the technicality. Future proceedings will thereby be guided into the proper channel at the start. But there is no need of fearing that the court is going to prevent in-

gredient makers from their "day in court." Even FSA has no desire to do that. All they wish to do is to concentrate the cases within a narrow area so that every Tom, Dick and Harry off the street may not claim to be an interested party in such appellate proceeding.

Cart Still Before Horse

THE SUGAR controversy was a long, technical and legalistic proceeding in Washington as the Food and Drug Administration again reviewed the canned fruit standards. It is most unfortunate that all this legal proceeding is necessary. But apparently we cannot escape it as the law is written and as it is being interpreted at F&DA.

But regardless of the views of laymen on legal proceedings, there is one element of encouragement in all this protracted controversy. There is evidence that FSA is trying to make a single comprehensive and significant record on the sweetener controversy. This as yet is but an unofficial effort. The cart still remains ahead of the horse in that standards of complicated manufactured foods are being judged without any fixed rulings on the simple ingredients. But at least one important official has indicated that he would like to unhitch the horse and reharness him at the right position. We hope he succeeds.

To accomplish this shift in the horse and buggy proceedings, there need be only one very simple action. FSA authorities may rule that hereafter whenever the sweetener controversy comes up a complete copy of the record thus far made shall be put in as a part of the record of subsequent proceedings. They can do this without the slightest danger of opposition by making such an entry one of the government's exhibits at the beginning of future hearings where sweetener competition is a question.

It seems logical that FSA should do this. Then it will be unnecessary to call back time after time the great array of legal talent, the medical experts who testify on dietetic values of sweeteners and those who merely define technical methods of manufacture or describe the identity of the sweeteners themselves. It would be a great saving of time and money if that could be done. There seems to be no sensible reason why the $1,500 per day, for 11 days, which the canned fruit hearing certainly cost the sweetener group in salaries and fees alone, should again be imposed on any of our industries.

Other groups interested in manufactured foods should seek to have such a plan organized for their protection. Ice cream manufacturers, the baking industry and numerous other groups would greatly benefit from it. If such a thing were done, the bulk of the proceedings in the future would relate to the main commodity under discussion, not merely to one of the groups of ingredients. This will make for expedition, clarity and promptness of action. In each case it would only be necessary to give the special details about each sweetener as it related to the particular manufactured commodity for which a standard is being made.

Let us hope that the official who has very wisely proposed this new method of proceeding may have sufficient influence to bring it into effect.

Turnover Of Food Control Personnel

AS MANY readers know, FOOD INDUSTRIES puts out a digest of all state and federal food laws and regulations in the "Food Industries Catalogs and Directory." In the year just passed, the most striking change observable is the very heavy turnover of executive personnel in state food law enforcement agencies. In 20 out of the 48 States of the Union there are new names in responsible jobs.

To food manufacturers, the importance of this observation lies in the possibility of unexpected changes in interpretations of the application of laws and regulations. Whether these changes of personnel have been cause or effect, the fact remains that more than half of the previous regulations have been changed in twelve months. Some of the changes are of minor importance, but some may be the cause of much perplexity to food manufacturers who come under their jurisdiction.

With half the regulations modified and with nearly half the enforcement personnel changed, it is incumbent on every one to exercise due care.

Labor Agitation Ruins Safety

MANY FACTORS enter into a successful safety program, including one that to us seems relatively new—peace of mind. The experiences of a food manufacturer whose safety record has been recently shot to pieces all point to lack of the mental tranquility as the cause.

The previous good record has been maintained in all departments except one. In this department the same employees, the same equipment, the same management and the same safety program continue as before. But, a labor agitator is now in the department, and as a result of federal laws, nothing can be done to stop him.

For many months the agitator has kept the department in a turmoil, and accidents have been increasing in frequency and severity. A few have been rather serious. To an outside observer it would appear that only voluntary withdrawal of the agitator or amendment of the Wagner Labor Relations Act will prevent an ultimate fatality. The possibility that the employees themselves will gang up on the agitator and bash his head in are too remote to be considered. Yet the Wagner Act is, in theory, for the benefit of mankind.

Spare Parts and Repairs

EVERY machine shop in the country is getting more and more business. Many are operating on two or three shifts. Management of most shops where food processing or packaging equipment is normally produced is doing its utmost to keep up to the normal schedule of production for non-military uses. But it seems inevitable that, as our armament program continues to expand, the problem of obtaining spare parts and repairs will become increasingly greater.

Accordingly, it is urged here that all factories in the food business lay in adequate reserves of repair and spare parts before the situation becomes urgent.

Don't Omit The Negative Directions

WHEN DIRECTIONS for household preparation of foods are attached to packages it is highly desirable that the household recipe be worked out with such care that no one can go wrong if she follows directions.

This, it seems to us, calls for negative directions on what to avoid as well as positive directions about what to do. A case in point is a very popular cookie that is delectable when made right but indifferent or unpalatable when made wrong. A brief investigation reveals that one of three errors are usually committed where failures occur: (1) Improper oven temperatures; (2) omission of one ingredient (nuts); (3) substitution of another shortening for butter.

While one can understand why a food manufacturer may not wish to incur the ill will of other manufacturers, it appears to be entirely possible to insert a diplomatic word of caution about substitute ingredients. In other words, we believe it would be good business to make the recipes infallible. A disappointed customer does not repeat her purchase.

ORGANIZING RESEARCH For PROFIT

Six simple fundamentals, intelligently applied, enable the food manufacturer to cash in on his expenditures for research

By THOMAS M. RECTOR
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Research on jellies is carried out in an air conditioned room at the Central Research Laboratories of General Foods Co.

SOME business men will, no doubt, read the title of this article with mixed feelings and wonder if the words "profit" and "research" should be in the same sentence. The "100 percent pure" scientist may feel slightly ill at the association of words, particularly if he is accustomed to spelling research with a capital R. The business man who has caught a live research man and has given him a chance to participate in the life of his business with profit to himself may be pardoned if he pats himself enthusiastically on the back. The most sympathic reader unquestionably will be the one who has been on both the research and business sides of this question and, therefore, understands that there is no essential quarrel between research and profit.

To dispel uneasiness at the beginning, let it be understood that what we are talking about is research spelled with a small r. By this we mean technical or applied research done by an industrial firm for the purpose of improving its service to the public. If such a firm has a research department that improves its products and develops new products when the old ones become obsolete, and if the value of the improvements is greater than the cost of the research, then obviously its research department has not only been organized for profit, but the profit is being obtained. If an industrial research department, however, doesn't show a profit in a reasonable time, it has lost its reason for existence.

A few weeks ago there appeared an item in the papers which, in a way, was quite tragic. It announced the dissolution or "death" of a corporation which had been devoted to the manufacture of gas mantles. These gas mantles represented a clever invention made after the invention of the electric light. For a long time the gas mantle flourished because gas distribution was developed far ahead of electrical distribution.

The company went ahead but finally electric light was almost universally available, and the gas mantles company went down hill. The death of the gas mantles company might have been preventable if the proper remedy had been taken in time. Probably the corporation did research on improving its gas mantles, but the scope of its program may not have been broad enough to contemplate perpetuating the life of the company by developing other services for sales to the public. As a result, a corporate organization of potentially great economic value to the country as a whole has been lost.

Thomas M. Rector, the author of this article, at his desk in the Central Laboratories of General Foods Corp.

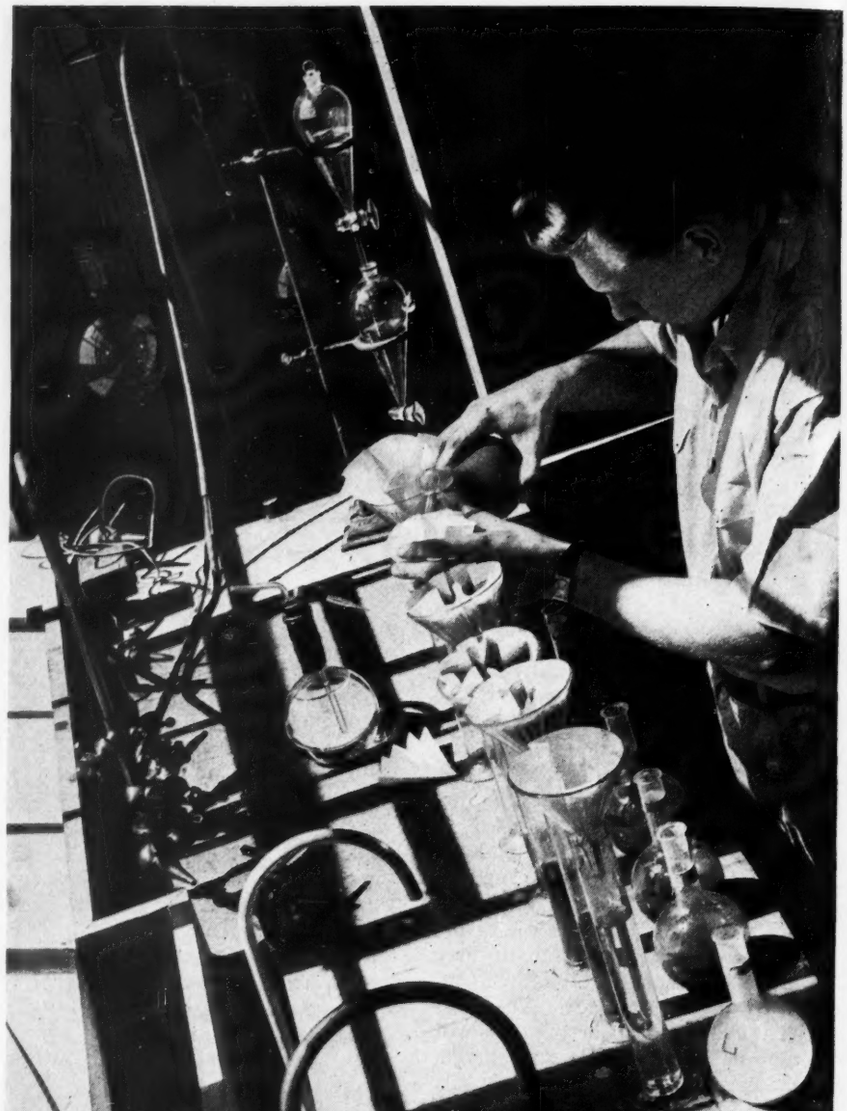
The fountain of youth for a corporation is technical research which has been properly organized for profit. Research, however, is strong medicine. It can be taken in too large doses and bankrupt the company. It can be taken in too small doses, and the more intelligent competitor using more and

better research can prevent the company from prospering. There are many kinds of research and many ways of conducting it, and the wrong kind administered by the wrong personnel in the wrong dosage can be fatal.

This may appear to be a gloomy picture until one realizes that the same thing can be said of automatic machinery, advertising or too much fried chicken.

Considering the profits to be made from research and the pitfalls to be avoided in conducting it, what should the industrialist do to establish a research department organized for profit? This, of course, is a major problem requiring the best consideration from the top management of a company. The management must take into consideration the company's position in the industry. It must determine how much money it can afford to spend for research, considering its competitive position in its field. It must consider also what it aspires to do in the way of consolidating its position in the field and expanding its activities. This survey requires time and close attention by an executive of high caliber. The most capable man in the firm is not too good for the job.

If the survey has been correctly made and the situation properly sized up, the conclusion cannot help but be that research is needed and that a capable research director must be obtained and research started.



As the largest producer of decaffeinated coffee, General Foods Corp. carries out continuous experiments on coffee at its research laboratories.

IN the food industry, the type of research director needed will in general be the type of technically trained man now classed as a "food technologist." At present the term "food technologist" is not too well defined, but in the future the term may eventually be used to describe a man of broad training in those sciences which bear most directly on the food industries.

Specialists in narrow fields are not usually well fitted to direct applied food research. Basic knowledge in chemistry and those sciences bearing on growth and nutrition are of primary importance. Such scientific training seasoned with resourcefulness and "horse-sense" and applied with the old "inspiration and perspiration" formula will produce the food technologist required for the job.

It goes without saying that the country should be searched thoroughly for the most capable man available, but after he has been found, management should by no means think its part of the job is over. A firm would not hire a bookkeeper, put him in a locked room, supply him with blank books and pencils and just tell him to "keep books." Yet every year research laboratories are started pretty much in this way. A firm feeling the need for research may hire a man without too much investigation into his capabilities, install him in a laboratory and then expect him to go ahead on his own steam. The unusual man will eventually fight his way out of this situation "by main strength and awkwardness." Unfortunately, this happy event occurs all too seldom.

It has been amply demonstrated that research can only function at its optimum efficiency when it is in close contact with the thinking of the top management. The president of the powder puff firm who finds his research department working on airplane bombs has only himself to blame. The technical research man is always ready to enter into the life and spirit of a business if he is allowed to know in which direction the business is headed.

The fact that top management should participate in guiding the research department does not mean that it should hold the research director's hand while he builds his laboratory and picks his assistants. A good research director is entitled to the freedom of action allowed a capable production or sales manager. It is not always very smart, however, to allow him any more freedom than these department heads enjoy.

Assuming that our company is starting its research department from scratch, it should probably allow its research director from three to six months to size up the situation before building his laboratory or hiring assistants. The research director

should first of all isolate the problems facing him in the immediate future, and make up his mind what type of assistance is required to attack these problems. While mapping his program he must bear in mind at all times the amount of money he is to be allowed to spend in the solution of these problems. If he is wise, he will line up these problems in accordance with the management's idea of their importance and not bite off more than he can chew with the financial teeth at his command. Once the research director has settled upon the staff he needs, he can then efficiently build his laboratory around his personnel.

After the personnel has been selected and the laboratory built, there will come a critical period of a few months in which the management of the corporation will be holding its breath awaiting results. During this period the research director should improve his contacts with the organization as a whole, letting every key man in the organization know that his laboratory is intended to be a service unit to him. He should also make it clear to the key men in the organization that he is most interested in having their ideas to be converted into research projects. He can use these opportunities to build up the confidence of the organization in the ability of their research department to solve problems. Contacts with the sales and production departments are, of course, of the most importance. The capable production executive will know which processes are in need of revamping for the sake of reducing costs. He will also know where quality can be improved. The research director must rely to a great extent on the sales management of the firm to point out the need for new products and for improvements from the standpoint of the consumer in old products.

The amount of help the research director may expect from individuals depends, of course, on the habits of thought of the men themselves. Some very capable sales executives may never have an idea for a new product or the improvement of an old one. Others may have ideas three times a day, and perhaps once a year one of them will make good. Periodical contacts with all these men are important, however, because each of them has his problems, and discussions of problems are a very fertile source of ideas for the research director himself.

Contacts, of course, must be maintained continuously between the research department and the general management of the company, and to the end that management may have financial control of research, a system of project authorizations and research budgets for a laboratory of any considerable size is a necessary adjunct.

When a research director has isolated his problems and has broken them down into research projects, he is in a position to estimate the probable cost of carrying out these projects. In some cases, the kind of work indicated and the results expected are such that fairly accurate estimates of cost and time are possible. In other cases, the problems are definitely of long-term nature and the research director can only estimate the cost of keeping a certain number of technical men busy on the project for a definite period. At the end of this period, a supplementary appropriation may be requested, and this will give management a chance to evaluate the results obtained to date and to decide whether or not further work is advisable.

It is at a time like this that a research director must become a salesman, and in some cases almost an evangelist, in order to keep worthwhile projects on his list. In many cases, in order to get a project approved, the research director must prepare a brief for the project just as a lawyer might prepare to plead a case. There have been many instances were projects have been turned down flatly by management and later reconsidered due to a research director's insistence, with large profits as a result.

The sum of the estimated cost of a laboratory's projects for a year should, of course, equal the amount budgeted for salaries, rent, depreciation of equipment and all of the other items which go into the cost of conducting a laboratory. The periodical consideration of laboratory job estimates by the management keeps it in touch with what the laboratory is doing and prevents research from running wild. A budget and job estimate system acts as a system of checks and balances and, if properly administered, keeps research work going on an even keel and steadily moving ahead.

A system of laboratory budgets along these lines may appear to be alarmingly complicated but, in reality, once the system is installed its operation is simple. The biggest hurdle the research director has to get over in the beginning is to convince his men that there is nothing particularly degrading or menial about filling out a cost record card.

THE system of cost record cards for individual technical workers should be set up so that there is an absolute minimum of nuisance to the worker. One way of simplifying the system is to distribute to each man every morning a card bearing his name and dividing the work day into half hour periods. Each project, of course, has a number, and at the end of the day the worker simply places the number of the project in the space provided. If he has worked on only one project during the day, he puts the number of it on the top of the card and draws a line down the card. If he has two or more projects, he assigns part of his day to each project. It should, of course, be carefully explained to the technical worker that these cards are the original records on which all the calculated costs of the research department are based and that, therefore, the filling out of the cards represents one of the worker's most important duties.

THE filling out of the daily cards soon becomes a habit. These cards represent the technical workers' only contact with the cost accounting department. The research director and his assistants, however, get from the accounting department at the end of the month a report showing how much money has been spent on each project during the current month, the accumulated cost of the project to date and the residual appropriation. This gives the research director a chance to compare money expended with results obtained and also automatically notifies him when he must terminate a project or ask for more money. Included in the cost of a research project must be overhead items such as technical supervision, materials, light, power, depreciation and numerous other items. The research director at the start will probably be very much surprised at the amount of overhead expense which must be added to "direct time" on a project.

In cases where a corporation has selected a capable research director and has allowed him relatively free rein in selecting his assistants and facilities for doing work, it has made an excellent start toward organizing its research for profit. When management has carefully examined its competitive position and has put into its research director's hands problems which when solved will improve its competitive position, it has taken the second essential step toward realizing a profit from its research. Continuance of research profit will depend to a great extent on the continuance of close cooperation between management and its research department.

An important part of the research director's contribution is to select the most capable staff available and to treat its members in such a way that their interest in and their loyalty towards their work is always at a highly sustained pitch. Research management should also accept the

(*Turn to page 72*)

BASIC PLANT OPERATIONS

Handling, sorting, separating and inspection made more efficient and economical by new methods and equipment devised for walnut factory

By ROBERT G. ENGEL†
Los Angeles, Calif.

This article on
PRODUCTION METHODS
Should be read by
All Food Manufacturers

Because it shows what can be done to improve several unit operations which are common to food plants. The old, accepted ways of performing the various operations were critically analyzed and then changed to take out waste motion and improve efficiency.—The Editors.

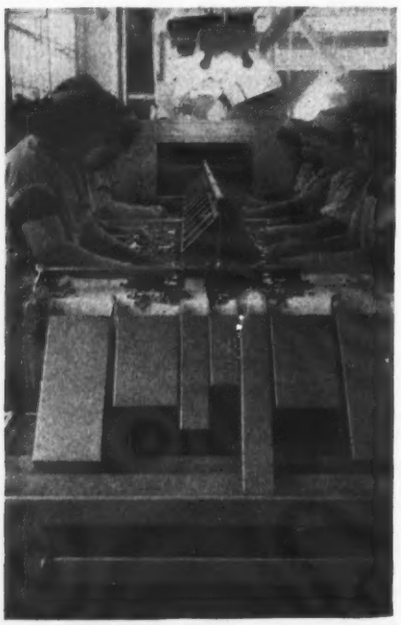
BY modernizing its plant layout and improving its production methods and equipment, important economies and better quality control have been attained by California Walnut Growers Association in its walnut shelling plant.

The improvements are to a large degree the results of motion economy, and the greatest savings can be attributed to the following changes:

1. Elimination of manual handling for almost 90 percent of loose shells.
2. Reduction from 16 to 4 in the number of instances where manual transportation is used between successive operations; reduction of distance traveled during these transportations to less than 10 percent of the former distance.
3. Elimination of all manual transportation for inspection.
4. Specialized manual operation on picking and grading machines.

In 1939 the following process was used:

The walnuts, delivered to the shelling plant in 100-lb. bags, were emptied into elevators which carried them into the hoppers of the mechanically operated cracking machines. These were located more or less arbitrarily on two upper floors of the factory building. After being cracked, the nuts were filled into the bags again, transported on hand trucks and over an elevator to the shelling department and discharged by hand into hoppers above the workbenches. All work places were fed by gravity, and the girls moved the cracked walnuts from the feed outlet to the center of their working space, separated the kernels from the shells and distributed the kernel pieces according to size and color in small containers. Shells were dropped into an opening in the table top, this being connected with a chute leading to the screw conveyors of the shell disposal system. Inspectors along the workbenches from time to time exchanged the filled containers for empty ones, weighed the production on automatic scales at the end of the bench, credited the operator and filled the different sizes and colors into wooden storage boxes. The boxes were trucked to a number of final grading conveyors where a final hand inspection was made. The rejects were hand picked and sorted into the same kind of small containers as mentioned before. Again the final product was dropped into boxes which were transported by hand truck to the elevator and then to the packing machines on the floor below.



Grading machine which contributes greatly to high efficiency in the plant of California Walnut Growers Association.

† The author was a member of the engineering staff which worked out the details for the new shelling plant of California Walnut Growers Association.

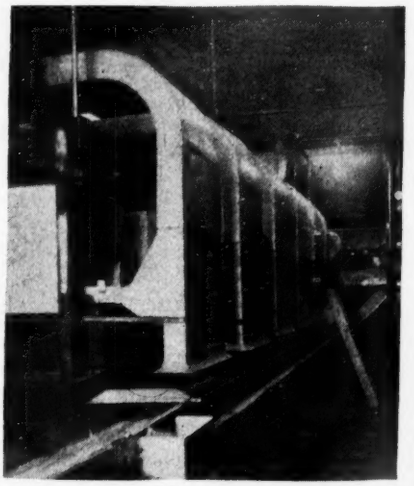
Let's review the picking and sorting operations for operators and inspectors:

Operator:

1. Spread material over the table.
2. Remove loose shells into drop discharge.
3. *Break kernel pieces loose from shells** and put the separated kernel pieces into the sorting containers. This is a combined operation of separating, sorting to size, sorting to color and **sorting re-cracks.***
4. Remove the shells to shell drop discharge.

Inspector:

1. Walk to operator.
2. Exchange full containers from operator's work place.



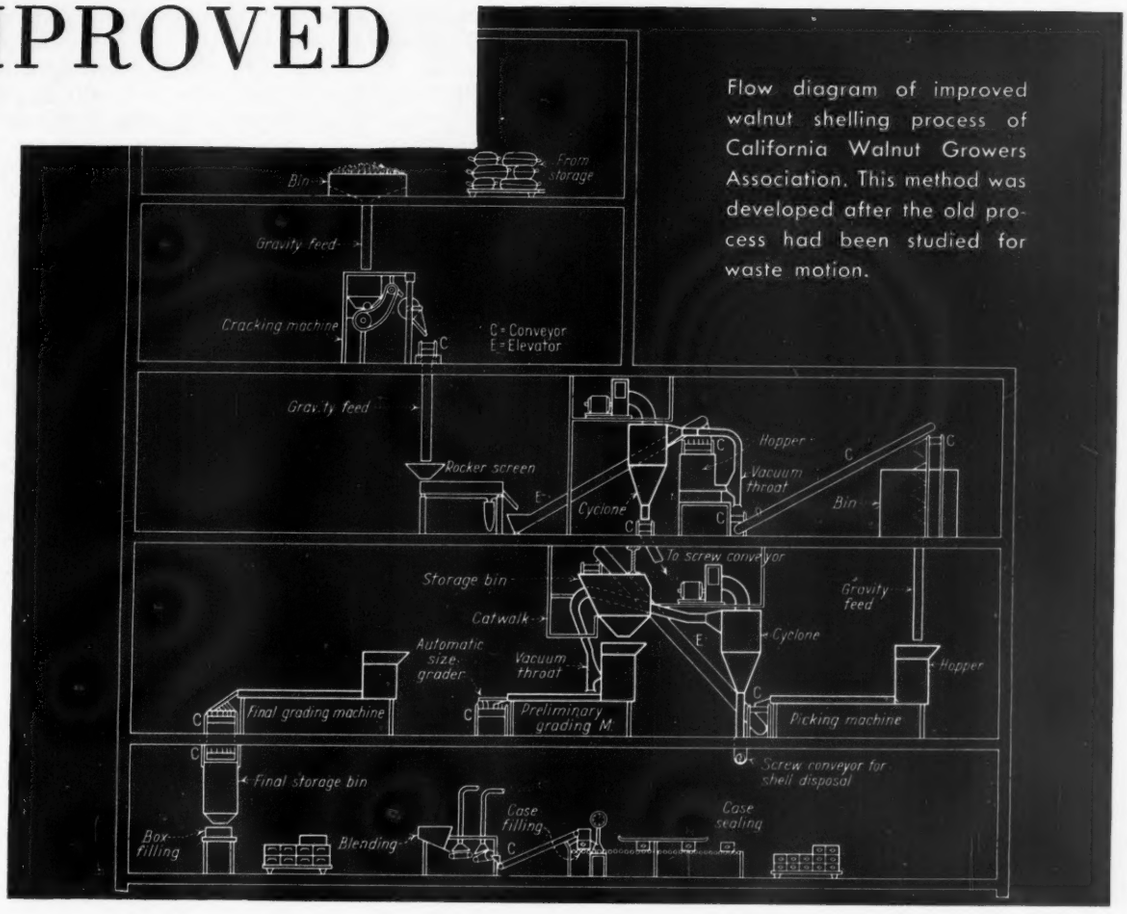
Cracked nuts, carried on a belt conveyor, pass under these vacuum separators. Here the loose, light shells are automatically sucked up from the belt, eliminating about 25 percent of the total volume of the cracked nuts.

3. Walk to scale next to which transportation boxes are located.
4. Check quantity by weighing and credit operator.
5. Check quality.
6. Discharge into transport boxes.

The analysis of this operation and the ensuing design of new equipment

* To show the advantages of the new method in comparison with the old, all that was carried over from the latter is set in *italics* for the new picking operation and in **bold face** for the preliminary grading operation.

IMPROVED



Flow diagram of improved walnut shelling process of California Walnut Growers Association. This method was developed after the old process had been studied for waste motion.

in 1940 led to the following changes (the numbers refer to operations listed above):

Operator:

1. Eliminated through delivery of material on machine belt.
2. Eliminated through automatic removal by vacuum before delivery to operator on machine belt.
3. Simplified through:
   a. Automatic size grading by machine, which eliminates human judgment and inaccuracy.
   b. Split of operation:
   First operation with prevailing manual skill—separating kernels and shells, later called "picking."
   Second operation with prevailing visual inspection—color sorting, later called "preliminary grading."
4. Eliminated through automatic removal by vacuum after picking and before preliminary grading.

The inspector's work was reduced through this arrangement to its main purpose—checking of the quality—and the number of inspectors was thus decreased.

All but two of the former sacking, boxing and trucking operations were eliminated. Of the two not eliminated, one is for the delivery of material to the final grading machines and the other for delivery to the packing machine (see flow diagram). This reduction in operations was achieved by groups of belt conveyors and elevators delivering the material to the individual machines and collecting the picked or graded material from the machines.

As the final grading operation was maintained as such, but with improvements, the new process uses three types of machines, deviating in construction only by length, width and arrangement of the superstructures over the belt for sorting.

The new process operates then as follows:

As the existing factory building with seven floors was high enough to use every possibility of gravity conveying, the new production process has a vertical flow of material extending over five floors. On the top floor a row of bins of large capacity are arranged so that the nuts can be fed into them from the bags. The nuts drop slowly into the feed hoppers of the cracking machines on the floor below, each cracking machine being located under a loading bin. All of the crackers are arranged in a straight line so that one conveyor carries the whole production of cracked nuts. A gravity chute discharges the cracked nuts to a rocker screen on the floor below. There the pieces which are too small for manual handling on the later operations are eliminated and sacked. From here the nuts are conveyed to the first shell-eliminating process operating by vacuum without manual labor. About 25 percent of the total volume passing through here is eliminated as loose shells whose specific weight is lighter than that of kernels or kernels attached to shells. These shells are conveyed over cyclones into the shell disposal system of screw conveyors leading to shell storage bins.

The remaining 75 percent of the material travels over conveyors or through gravity to the picking machines on the floor below where it is discharged into feed hoppers above the machines. Vibrators on the bottoms of the hoppers load the belts on the picking machines. Eight girls operate each picking machine, four on each side. The kernels are separated manually from the shells, and the unsatisfactorily cracked nuts, called "recracks," are placed in the middle track of the machine belt.

All material from the picking machines is discharged on a common conveyor and from the conveyor to a belt elevator. The recracks leave this elevator and branch off to a recracking machine, and the bulk of the material travels on another belt conveyor to the storage bins over the preliminary grading machines where the material is dropped into hoppers

like those of the picking machines. When the material passes the vibrator on this machine, a vacuum unit again eliminates the loose shells—broken off at the picking operation—and conveys about 40 percent of the total shell volume into the shell disposal system. Therefore, only 10 percent of the shells remains to be handled manually on the preliminary grading machine. Part of these remaining shells are still attached to the kernels or kernel pieces.

But the main operation is a preliminary sorting of the standard commercial colors: "Diamond," "Emerald" and "Suntand." All colors deviating from the bulk are called "off-grade." These and the recracks and shells are dropped into the compartments in the center of the machine, these compartments leading to the individual conveyor tracks collecting from the whole row of preliminary grading machines. The bulk of the sorted material passes to the end of each machine over an automatic size grader that is mounted on top of the conveyor. This grader separates the kernels into half-nut, large and small sizes and drops each size onto a separate conveyor track. There are six tracks over one wide belt, these tracks being separated by dividers. This belt discharges through a system of gravity chutes into wooden storage boxes with a capacity of about 40 lb. each. About 70 percent of all materials discharged is of the best commercial grades—halves and large pieces.

The final grading operation is almost a repetition of the sorting process as done on the preliminary grading machines. To fulfill the highest inspection standards, the operator-inspectors on each machine specialize in one size only—halves, large pieces or small pieces. Their operation is a second color sorting and the detection and elimination of small defective pieces.

The removed pieces are dropped into compartments in the center of the machine like those on the preliminary grading machines. The chutes to the conveyor are interchangeable so that each track on the machines can discharge into any of the conveyor tracks. This flexibility is very important because of the variations of quality caused by the natural differences of the product. The five standard grades are then conveyed to final storage bins on the floor below. These bins are located next to the final dust cleaning unit, a vacuum device connected with the carton filling machine. A large part of the production is packed immediately after delivery to the final storage bins, and some is filled into boxes for storage.

The storage capacity between the machine groups is just large enough to guarantee a constant production flow. The hoppers of the picking machines accommodate enough for one hour's work, whereas the bin over the preliminary grading machines takes about a four-hour supply. Therefore, the regular flow of production requires only a few hours from the cracking machine to the packing machine, and the product is packed in very fresh condition.

A few technical features are worthy of a more thorough description:

Visibility on machines: Although there is ample daylight throughout the whole shelling plant, each machine is equipped with two double units of fluorescent lamps except for the preliminary grading machines, which have only one double unit because of their shorter length. Each unit is 4 ft. long. This light is perfect for distinguishing colors and blemishes.

The machine belts are of a light cream color and contrast well against kernels and shells. All machine parts coming in contact with the operators' hands are of stainless steel with a dull, non-reflecting finish.

Automatic size grader: Every preliminary machine is equipped with two size graders driven by a ½-hp. motor over a pulley mounted in the center of the graders. The graders consist of spiral screws with two reductions of diameter towards the front end. A spiral thread moves the kernel pieces along, and in the longest section of the grader the small pieces drop through a narrow slot between the screws onto a chute discharging them into one of the conveyor tracks. After the first reduction of diameter, the larger pieces drop through a wider slot into another conveyor track. Only the halves continue to the end, where they drop into the conveyor also.

Adjustable speed arrangements: The machines, vacuum equipment and conveyors have speed adjustments to meet large fluctuations in the output of kernels from different grades of walnuts. The machine feeds are adjustable by changing the vibrator resonance of the feed hoppers. The conveyors are driven by variable-speed motors allowing an adjustment of 3:1. But the standard speed is set close to the lowest possible speed of about 65 ft. per minute.

To prevent wear by fine dust, all motors are of the enclosed type and all bearings are sealed.

Multi-track conveyors: The conveyors contain sufficient tracks to allow each grade to travel on an individual track. This is accomplished by dividers running parallel to the trough side walls all along the conveyor above the belt. At the end, the products are discharged into individual chutes leading to other conveying equipment, bins or boxes. The dividers are fastened to cross brackets, which are in turn fastened to the conveyor top. These dividers are adjustable in height to prevent the catching of small pieces or shells between them and the belts. The widths of the conveyor tracks vary from 3 to 6 in. and the total belt width is from 16 to 24 in.

The conveyors leading to the vacuum units and to the final bins discharge mechanically at the different locations. This is accomplished by using a number of narrow belts instead of a wide one, these belts being of different lengths. The belts are driven from a drive-end section containing one roller for all belts.

Here's how the job of separating shells and kernels was done before a much better system was devised and adopted. This scene is typical of the sorting and inspection departments of food plants, so perhaps other food industries can profit from the new methods adopted by California Walnut Growers Association.

32 INVENTIONS
Needed by the Food Industries

TO those who do not understand the true function of research, the following list of so-called needs of the food industries will be a source of valuable ideas. The list was compiled by Research Advisory Service, 51 E. 41st St., New York, (a cooperative financial advisory service) by requesting a large sector of American industry for its ideas about needed inventions.

That many of these "needs" have already been developed and are already in use, while others are known in principle if not in actuality, will be readily conceded by well-informed food technologists. Yet the entire list is deserving of study by every executive and ambitious man in the food industries. For it represents the first step in any organized research problem, namely, a definite statement of a need.

1. A process for canning green vegetables whereby the natural green color of the food is retained through the canning process and subsequent storage by a method which prevents the destruction of the chlorophyll upon which the natural green color is dependent.

2. A good liquid or powdered coffee extract which, upon dilution, would yield a beverage with taste and aroma fully equal to that of freshly and correctly brewed coffee.

3. In the field of flour milling, a perfection of processes and methods whereby certain vitamins may be added or retained in white flour.

4. A drying or processing method to produce whole dry milk, including the butterfat, in such form that the butterfat will not become rancid during reasonable length of storage.

5. A means of raising the melting point of chocolate so as to lengthen the shelf-life of chocolate-coated candies. The production of chocolate goods is almost completely halted by the hot, humid climatic conditions of the summer months.

6. A problem that flavors introduce is that of rapid oxidation and subsequent rancidity. There is a marked need for a good anti-oxidant for many food products.

7. Because most manufactured cookies are alkaline and are subjected to rapid baking at high temperatures, delicate flavors are not retained well in the finished goods. If a fixative, or process for retaining delicate flavors in manufactured cookies could be developed, it would be valuable to the biscuit and cracker industry.

8. There are several hundred million bushels of soft winter wheat produced in this country each year, but with the advent of high-speed dough mixing machinery, this soft winter wheat is not adaptable to bread making. We need a process or material which could be added to soft wheat flour that would activate the protein so that soft wheat flour could be put through modern bakery equipment. With this, a large agricultural area, particularly that lying east of the Mississippi River, would be helped materially. Furthermore, it would improve the qaulity of the loaf of bread.

9. Some way of retaining oven aroma in bread and other bakery products for 48 hours.

10. A successful process for preserving bread by freezing.

11. There is a need for revamping the system used by bakers to get their products to the consumer oven-fresh. The canning industry makes units suitable for small sized families; for example, a small can of peas sufficient for two people. The contents are entirely consumed at one meal and there are no leftovers. Bakers might do well to follow this lead.

12. A cheaper bleach for flour that will do the same job as Novadelox or Agene.

13. A product which, added to a cereal, will be harmless and tasteless to human beings, but will prevent infestation by weevil or flour moth.

14. A yeast whose rate of action in the doughs would be slower at temperatures of between 80 and 90 deg. F.

15. A method to reduce the high cost of distributing milk to the consumer. This will probably be a specialized process for concentrating and canning milk to preserve the normal color and flavor of the product so that, when diluted back to original volume in the home, the product will closely simulate pasteurized milk. Such a process will enable the producer to can milk in areas where milk is cheap, and deliver a supply to last a month or more.

16. A method of freezing cream so that when remelted it retains all of the properties and taste of fresh cream.

17. A better alkali for neutralizing the acid in sour cream for butter making. The lime neutralizers now in use make the cream too thick for easy thorough straining. The soda neutralizers facilitate straining, but have an undesirable flavor.

18. The citrus industry needs a quick method of removing the green chlorophyll without injury to the skin of the fruit.

19. A canned, dried or frozen orange juice which would retain the flavor, color and vitamin content of fresh orange juice.

20. In the refining of cane sugar, the greatest needed development is a cheaper method of decolorizing sugar sirups. The present standard method of filtering these sirups over bone char is expensive, slow and tedious.

21. When we mix a sponge to make soda crackers, yeast is added which is allowed to ferment until there is a considerable amount of alcohol formed which is lost when the baking process begins. The recovery of this would lead to considerable profit.

22. Every year thousands of tons of peach pits are hauled to the dump. Inside the pit is the peach kernel in which is concentrated the entire essence of the peach. We need a process whereby the kernel could be used to flavor products.

23. A method whereby we can put a beef belly (carrying very large amounts of exposed fat) into storage for periods up to one year and then bring this belly out, defrost, put to cure and market with the fat in good condition. This is not possible now because the fat suffers deterioration, resulting in a fishy, rancid flavor.

24. A system of meat distribution whereby all of the boning is done in a central meat packing plant with nothing left for the butcher to do but hand out the packages.

25. The packing industry would like a process to afford improvement in the keeping qualities of meats. Generally speaking, it endeavors to retard bacterial growth by: (1) chilling or freezing, (2) packing the sterile product in an air-free container, either tin or glass, (3) the use of salt, and (4) desiccation. These processes are still fundamentally the same today as they were at their beginning.

26. The packing industry has slipped into a deplorable condition with respect to the manufacture and sale of lard. At least one hundred million additional dollars could be returned to the hog farmers of the country if lard were back on the same basis it was before the advent of the various types of shortening oils. Successful research in relation to the manufacture and sale of lard for new purposes would have a very far reaching effect.

27. There is an almost unlimited field for research in both edible and inedible byproducts of the meat packing industry. Much is still to be developed through improved uses for bone, blood, hair, wool, leather and so forth. Animal glandular derivatives and the use of liver as a therapeutic are but two examples of new uses for edible byproducts.

28. Process to convert the solids in spent distiller's grain after it has passed through the drying equipment. This material is a thin liquid and is now wasted although a considerable quantity of protein and livestock food value still remains.

29. A method of quickly and accurately determining the vitamin values of foods. Today the process of checking vitamins requires a month's time.

30. A cooking oil or grease for deep fat fryers having a breakdown temperature of 500 deg. F. or higher.

31. A method of preventing the rancidity of fats and oils would extend the shelf life of cereals and other fat-containing foods.

32. A means of bottling milk entirely devoid of oxygen.

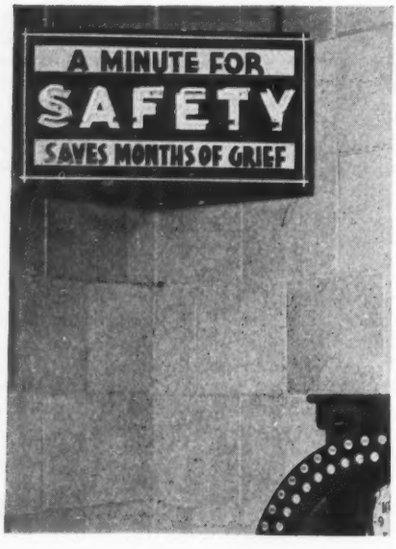
It PAYS To Advertise SAFETY

Food plant workers respond to accident-hazard posters by having fewer mishaps

Few workers are so heartless as to be unimpressed by this National Safety Council poster recently used by Corn Products Refining Co., Argo, Ill., and considered as one of two most effective posters recently displayed by it. Kept up for one week, the poster appeared on the bulletin board of each department in the four plants. There were no lost-time accidents while its impression lasted.

HIDDEN
TROUBLE
HEAD OFF TROUBLE
WHEN YOU TAKE THE HEAD OFF A SNAKE HE BECOMES HARMLESS. WHEN YOU TAKE THE HEAD OFF A BARREL TROUBLE BEGINS UNLESS YOU
SNAKE OUT THE NAILS

Many painful injuries or dangerous infections develop as a result of employees getting their flesh torn on nails left in the tops of open barrels. So Continental Baking Co. designed this effective "rattlesnake" poster to curtail such accidents.



Something different and effective is used as a safety "poster" by Hershey Chocolate Corp., Hershey, Pa. It is this Neon safety sign with a slogan on it, the slogan being changed frequently. Hershey has four of these signs, located near time clocks and in main corridors. The company thinks the sign is more effective than other safety posters.

Prior to the use of this specific-example safety poster, Armour & Co. had eight or ten serious hand injuries in a period of two or three months. But after this poster was displayed there were for months no serious injuries of the kind pictured on the poster. One thousand of the posters were displayed from two to four weeks on the bulletin boards in various branch plants of the company.

RECKLESSNESS, abstraction and improper attitudes are outstanding causes of accidents in food plants, according to the findings of National Safety Council. And more than 90 percent of its accidents are due to inattention on the part of employees, Continental Baking Co., New York, N. Y., reports.

This situation, together with the fact that food plants trail other industries in accident prevention, means that food plant executives must make their employees more safety conscious. One of the tools for doing this is the plant safety poster. Effective posters, effectively used, get results, experience has proved.

Posters may be effective in two ways. They may direct attention dramatically to specific hazards in a plant or department, or they may make a strong emotional appeal for greater safety in a broad, general sense. Some food companies have found one type effective, while others praise the other type. Both types are illustrated on these pages.

In regard to the way to use posters effectively, most food safety engineers are in agreement. They believe that the poster must be placed where it will be seen by all employees, as at time clocks and over drinking fountains. And they believe the poster should be left up only long enough to register its impression and then be removed or be replaced by a new one.

A poster put on a bulletin board that has been empty for some time is sure to get attention through its surprise value. So one company which is quite successful in accident prevention in the food industry puts up a new poster every month, but leaves it up only one week. For three weeks the poster board is empty. Another food company, also good at accident prevention, changes the posters every week.

This specific-hazard National Safety Council poster was very effective, especially in the shipping department, the barrel department and the ice house, Anheuser-Busch, Inc., St. Louis, reports. The company feels that it has decreased toe injuries in these departments through the use of this and similar posters. The company places its safety posters at 25 points, such as time clocks, lunch rooms, exits and main traffic aisles. The posters remain up approximately one week.

Some safety engineers find it effective to drive home a specific safety message in posters. And that type of message is doubly effective if based upon an actual mishap, as is this one of Continental Baking Co., New York. Continental sends a new safety poster to each branch plant each month. These are kept on prominent, lighted bulletin boards for a week or so, until the message has fully registered.

THIS ACCIDENT HAPPENED IN ONE OF OUR BAKERIES
EXCESS WEIGHT AT FRONT CAUSED REAR OF TRUCK TO UPLIFT. HANDLE STRUCK EMPLOYEE'S LEG— BREAKING IT.
THIS LOAD WILL MOVE EASIER ... WILL NOT TIP!
R. C. HAYES
Safety Engineer

When displayed by Pabst Brewing Co., Milwaukee, this broad-appeal National Safety Council poster produced more comments by foremen than any so far used because of its human interest value. The poster was put up on the bulletin board at each department time clock, a total of 20 locations, for 30 days.

Preference for pickle sweeteners being determined by tasting. The results have a significance for all food manufacturers.

200 Tell What

And reveal taste choices significant

By

R. G. SWITZER**

and

F. W. FABIAN

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FLAVOR in pickles is more important than it is in some food products. Pickles can be classified as a relish and relishes are not considered a necessary part of the diet. The flavor of pickles is due to taste, which includes their sweetness, sourness, saltiness, and spiceness, and to their odor, which is due to the volatile nature of acetic acid and to the essential oils in the spices used in their preparation. Crispness, while not a part of flavor, is a desirable attribute since people associate a soft or flabby condition in pickles with spoilage.

In the experiments recorded here, the influence of sugars and acid on flavor was being determined and not the influence of salt or spices. For that reason there were only two variables, sugar and acid. However, in any given experiment there was only one variable, acid or sugar. The percentages of salt and spices were kept constant for all experiments, while the acid or sugar content was varied within practical limits.

Four series of jars were prepared. In the first two series the sugar was kept practically constant at 37 deg. Brix (20.3 deg. Baumé) and the acidity kept at two levels, 2.0 and 2.28 percent acid calculated as acetic. In the second series of two experiments, the sugar was kept constant but at a lower level, approximately 33.0 deg. Brix (18.2 deg. Bé.), than in the first two series and the acidity varied as in the first series.

Three combinations of sugar were used in all experiments as follows: 100 percent sucrose (beet sugar), a combination of 75 percent sucrose and 25 percent dextrose, and a combination of 50 percent sucrose and 50 percent dextrose. This made a total of six series of jars at a low acidity, 2.0 percent or 20 grains, and six series of jars at a higher acidity, 2.28 percent or 22.8 grains, in which sucrose alone and two different combinations of sucrose and dextrose were used. A sufficient quantity of pickles was made with each combination so that several hundred jars in each series were available for testing.

Jars of all the various combinations were then sent to 40 different pickle companies and food laboratories throughout the United States from coast to coast and into the southern states so as to obtain a representative cross section of opinion from all parts of the country. Approximately 200 people, including pickle manufactur-

This Article on
CONSUMER PREFERENCES
Is of interest to
All Food Manufacturers

Because the idea here is to find the combination of flavors that will sell the most goods. Maybe you are not in the pickle business, but you will find something useful here about how to test consumer preferences and interpret them as possibilities of sale. Another striking fact revealed is that flavor is at least a three-dimensional (perhaps a four-dimensional) matter. If you ever have to try to please the public's taste, you will find this article worth reading.—The Editors.

* Paper presented before Technical School for Pickle and Kraut Packers, Michigan State College, February 22, 1940.

** Industrial Fellow Corn Products Refining Co. Journal Article 445, n.s.

ers and salesmen and the laity, participated in comparing the flavor and general palatibility of the different series of pickles.

The samples were marked in code so as to preclude the possibility of identification of the various combinations. A sheet of instructions for sampling and testing the pickles and also a sheet for recording the data were sent to all those participating in the experiment. The sheet of instructions explained the method to use in tasting the pickles to give the most accurate results. The data sheet for recording the results had the code numbers corresponding to those on the jars for the tasters' convenience and to avoid confusion. It is felt that every precaution was taken to avoid confusion and to secure as accurate information as possible with such an experiment. The tasters were asked to record their preference in each series as first, second and third choice. The results of the tasters' preference for the various combinations are found for each series in columns two, three and four of Table I.

They Prefer in Pickle Sweeteners*

to all food manufacturers

Discussion of Results

There was practically no difference in the first choice of the 205 tasters between pickles finished with 100 percent sucrose and those finished with a combination of 75 percent sucrose and 25 percent dextrose in Series I, Table I, which contained 20 grains of acid and had a 20 deg. Bé. concentration of sirup. Seventy-three chose sucrose and 75 chose the combination of 75 percent sucrose and 25 percent dextrose—a slight difference in favor of the combination. The majority of the observers commented that it was extremely difficult to note any difference in sweetness in 25 percent replacement of dextrose for sucrose as compared with 100 percent sucrose. A combination of the two sugars in equal proportion did not rate as high, receiving only 58 first choices (Table I).

When the ratings for second choice are considered, the combination of 75 percent sucrose and 25 percent dextrose still leads slightly over 100 percent sucrose, but the 50–50 combination of the two sugars rated a poor third. There was a greater number of the 50–50 combination and fewer of the other two combinations listed as third choices.

When the acidity was increased to 22.8 grains and the Baumé remained the same, as in Series II, Table I, the results were different. This showed the influence on flavor of just a slight amount of acid—only 2.8 grains or 0.28 percent. The 100 percent sucrose registered 101 first choices to 53 and 47, respectively, for the 75–25 and 50-50 combinations of sucrose and dextrose. The second choices are more evenly distributed than in Series I, but there is a greater difference in the distribution of third places in Series II than in Series I.

Lowering the sugar content, as was done in Series III and IV, and keeping the acid content the same changes the distribution of choices even more. Comparing Series II and III, one finds that lowering the sugar content 2 deg. Bé. (Series II) has about the same effect as raising the acidity 2.8 grains (Series II). That is, there is an increase in the number of first choices in favor of sucrose. These and other experiments in our laboratory have shown that in the flavor of pickles there is a very definite ratio between acidity and sweetness. As a rule, one

Table I — Results of Consumer Preference for Pickles Finished with Sucrose and Combinations of Sucrose and Dextrose at Different Acidities.

Place	Sucrose 100 %	Sucrose 75% dextrose 25%	Sucrose 50% dextrose 50%	No. of tasters	Grains acid	Baumé	Brix	% salt
			Series I					
1sts	73	75	58	206	20	20.19	36.7	1.50
2nds	82	88	36	206	20	20.19	36.7	1.50
3rds	51	43	112	206	20	20.19	36.7	1.50
			Series II					
1sts	101	53	47	201	22.8	20.30	36.9	1.51
2nds	71	71	59	201	22.8	20.30	36.9	1.51
3rds	29	77	95	201	22.8	20.30	36.9	1.51
			Series III					
1sts	97	67	32	196	20	18.19	33.0	1.50
2nds	55	73	68	196	20	18.19	33.0	1.50
3rds	44	56	96	196	20	18.19	33.0	1.50
			Series IV					
1sts	110	53	28	191	22.8	18.36	33.3	1.50
2nds	35	67	89	191	22.8	18.36	33.3	1.50
3rds	46	71	74	191	22.8	18.36	33.3	1.50

Table II — Evaluation of Votes Received for Pickles Finished at Different Acidities with Sucrose and Combinations of Sucrose and Dextrose.

Note: Taking all the previous data from Table I and multiplying the first places by 3, the second places by 2, the third places by 1, and adding the scores together to secure the possible number of sales over a given period of time, the data presents itself as follows:

Place	Sucrose 100%	Sucrose 75% dextrose 25%	Sucrose 50% dextrose 50%	Total No. of jars	Grains acid	Baumé	Brix	% salt
1sts	219	225	174		20.0	20.19	36.7	1.50
2nds	164	176	72		20.0	20.19	36.7	1.50
3rds	51	43	112		20.0	20.19	36.7	1.50
Total jars	434	444	358	1,236				
*Per 1,000 jars	351	359	290	1,000				
1sts	303	159	142		22.8	20.30	36.9	1.51
2nds	143	142	118		22.8	20.30	36.9	1.51
3rds	29	77	95		22.8	20.30	36.9	1.51
Total jars	475	378	355	1,208				
*Per 1,000 jars	393	313	294	1,000				
1sts	291	202	96		20.0	18.19	33.0	1.50
2nds	110	146	137		20.0	18.19	33.0	1.50
3rds	44	56	96		20.0	18.19	33.0	1.50
Total jars	445	404	329	1,178				
*Per 1,000 jars	378	343	279	1,000				
1sts	330	159	85		22.8	18.36	33.3	1.50
2nds	71	135	178		22.8	18.36	33.3	1.50
3rds	46	71	74		22.8	18.36	33.3	1.50
Total jars	447	365	337	1,149				
*Per 1,000 jars	389	318	293	1,000				

* Number of predicted sales of each in a given time out of a total of 1,000 jars.

degree strength of sirup on the Baumé scale is equivalent to one grain acid strength on the acidity scale, from the standpoint of flavor.

The greatest difference is apparent, however, when both the acidity and sugar content are lowered as was done in Series IV. The 50–50 combination of sucrose-dextrose suffered the greatest loss of first choices by these changes. (See Series II and IV.) For every one-grain increase or decrease in acid strength on the acidity scale, there should be a corresponding increase or decrease of one degree strength of sirup on the Baumé scale to maintain the proper balance. This is demonstrated in Table II. For a mild sweet pickle this rule should be followed.

Evaluation of Results

There are several methods by which a set of data such as these may be evaluated. Platt[4] has devised a numerical system of arriving at consumer preference. He claims that with this system the opinions of the consumers can be interpreted and evaluated on a relative basis in terms of probable sales. He has assigned the following values to determine the meaning of the votes for preferences:

"If a man marks his opinion of a sample 'Poor,' he will probably not buy it once in any given period. Such votes are given a value of 0.

"If a man marks his opinion of a sample as 'Fair,' he will probably buy it once in a given period. Such votes are given a value of 1.

"If a man marks his opinion of a sample as 'Good,' he will probably buy it twice in a given period. Such votes are given a value of 2.

"If a man marks his opinion of a sample as 'Extra Good,' he will probably buy it three times in a given period. Such votes are given a value of 3."

Using this system and assigning first, second and third choices values of 3, 2 and 1, respectively, we can arrive at values that should help in drawing conclusions from the data. The evaluation of these votes or choices is found in Table II.

The results secured by this system of evaluation substantiate the data presented in Table I. There would be practically no difference in sales between the pickles packed in 100 percent sucrose and a combination of 75–25 percent sucrose-dextrose. The slight difference is in favor of the latter. With this system the 50–50 combination of sucrose-dextrose shows to better advantage.

The influence of an increase in acidity and a decrease in sugar is likewise reflected in the sales of the combinations of sucrose and dextrose. These results would indicate that a combination of 20 grains acidity and a 20 deg. Bé. is the best to use when dextrose is substituted for sugar in the proportions used here.

Differences in Taste

These results also confirm what is generally known by pickle packers as to the difference in the consumer's flavor preference in pickles. There is not only a difference in different sections of the country but also between individuals. Certain regions of the United States like sweet pickles sourer than others. Likewise, certain localities prefer more salt in certain types of pickles such as genuine dill pickles, processed dills and Polish dills than do others.

Advantages of Dextrose

Several investigators[1,2,3] have observed that when dextrose replaces sucrose in the proportions used in these experiments for finishing pickles, the pickles are crisper and the volume increase is greater than in those finished in sucrose alone. Another advantage noted is that there are fewer flat pickles. This is due to the rapidity with which dextrose penetrates the pickles when they are placed in strong sugar solutions.

Dextrose is also less expensive than sucrose as a source of sugar solids. For example, to finish a barrel of pickles at 20 deg. Bé. it theoretically requires 152.5 lb. of total solids. For pickles containing 1.5 percent salt and 20 grains of acetic acid, the total solids in the liquor per barrel is accounted for as follows: Salt, 11.4 lb.; vinegar, 3.6 lb. A total of 15 lb. (calculated on the basis of sugar equivalent) of the 152.5 lb. is due to salt and vinegar, leaving a balance of 137.5 lb. to be made up with sugar.

In practice, however, records show that the loss of sugar through waste and spoilage of sirups averages between 10 and 15 lb. per barrel. For this reason 150 lb. of sugar per barrel of pickles is a more correct figure to use in calculating actual costs to the pickle manufacturer.

At the time this was written, the price of cane or beet sugar in bag lots was $4.50 per hundredweight. The price of dextrose in bag lots was $4.00 per hundredweight. On the basis of these prices, the cost of the sugar for a barrel of pickles would be as follows:

Cost of Sweetening (prices f.o.b. Lansing)

1. 100 percent sucrose, 150 lb. at $4.50 per cwt. $6.75
2. 75 percent sucrose + 25 percent dextrose replacement for sucrose:
   - **A. When beta dextrose is used:**
     112.5 lb. sucrose at $4.50 per cwt. = $5.06
     37.5 lb. beta dextrose at $4.00 per cwt. = $1.50..... 6.56
     Saving per barrel of pickles.... 0.19
   - **B. When alpha dextrose is used:**
     112.5 lb. sucrose at $4.50 per cwt. = $5.06
     41.0 lb. alpha dextrose at $3.50 per cwt. = $1.44..... $6.50
     Saving per barrel of pickles.... 0.25
3. 66 2/3 percent sucrose + 33 1/3 dextrose replacement for sucrose:
   - **A. When beta dextrose is used:**
     100 lb. sucrose at $4.50 per cwt. = $4.50
     50 lb. beta dextrose at $4.00 per cwt. = $2.00..... $6.00
     Saving per barrel of pickles.... 0.25
   - **B. When alpha dextrose is used:**
     100 lb. sucrose at $4.50 per cwt. = $4.50
     54.5 lb. alpha dextrose at $3.50 per cwt. = $1.91..... 6.41
     Saving per barrel of pickles.... 0.34

Summary

The results of these experiments show the following:

1. The ideal combination of sucrose and dextrose in a 20 deg. Bé. sirup at 20 grains acidity is 75 percent sucrose and 25 percent dextrose. This combination was slightly better than sucrose alone.
2. Increasing the acidity 2.8 grains in a 20 deg. Bé. sirup decreased the number of first choices in the sucrose-dextrose combination as compared to sucrose alone.
3. Reducing the sugar concentration from 20 to 18 deg. Bé. at 20 grains acidity decreased the number of first choices, but not as much as increasing the acidity 2.8 grains at 18 deg. Bé.
4. Increasing the acidity 2.8 grains in both the 18 and 20 deg Bé. sirups reduced the number of first choices in both the sucrose-dextrose combinations as compared to sucrose alone.

Conclusions

The tasters were more sensitive to slight increases in acidity than they were to slight reductions in sweetness. This indicates a rather delicate balance between acidity and sweetness.

There is a very definite ratio between the grains acid and the degrees Baumé in pickles. Within practical limits, for every grain increase or decrease of acetic acid there should be a corresponding increase or decrease of one degree Baumé.

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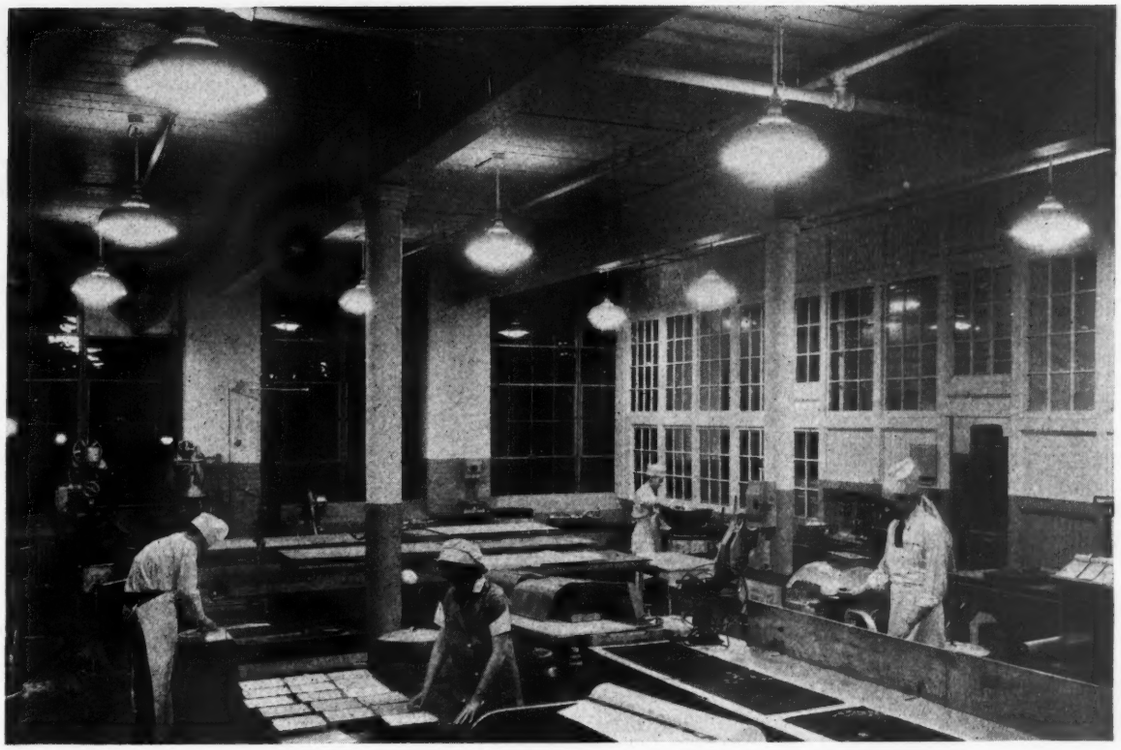
[3] C. R. Fellers, J. Miller and T. Onsdorff. Dextrose in the Manufacture of Fruit and Vegetable Products, *Ind. Eng. Chem.* 29, 946–949, 1937.
[4] W. Platt. How Will Consumers Rate Your Product? *Food Industries*, Jan., 1937.



By providing a good seeing environment, such as illustrated here, employee morale is better and production costs are less.

Seven Ways To Be WRONG In Factory Lighting

Check your plant illumination for these mistakes

By DEAN M. WARREN

General Electric Co.,
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LIGHTING serves but one purpose in industry, and that is to enable the employee to see. Seeing can, of course, be done under lighting of less than one foot-candle. But, by providing the right amount of light and the right kind of lighting for the job, the employee can see quicker and easier, and this results in direct compensation to the employer in the tangible form of (1) fewer accidents, (2) improved quality of product, (3) decreased production costs and (4) reduced spoilage with resultant greater profits. That isn't all, however, for a good seeing environment also brings about an improvement in employee morale, which, although intangible, is vital in successful plant operation.

To determine whether a lighting system is a help or a hindrance to efficient seeing, and hence efficient plant operation, a frequent and regular check should be made. As an aid in taking an inventory the following discussion is offered.

1. *Is Lighting Uniform?*

In most cases it is desirable to have fairly uniform general illumination throughout any particular work area, since where the lighting is very uneven, with extreme contrasts between bright and dim areas, eyestrain generally results. Seeing is then difficult because unconsciously the worker's eyes are continually trying to adapt themselves to the many lighting conditions in the field of view.

Uniform illumination is desirable also from the standpoint of maximum availability of floor space. Machines and benches can then be arranged for the most efficient plant operation without the outmoded question of "Whether there is enough light for the job over in the corner."

2. *Are There Bad Shadows?*

The presence of harsh, dark shadows constitutes a primary accident hazard because they may obscure objects that should be seen. Shadows slow up production, are a contributing cause of accidents to operators and are likely to cause errors in operation. Shadowy interiors hide dust and dirt, thereby affecting plant maintenance. Shadows may be caused by (1) inadequate diffusion of the light, (2) the wrong placement of light sources, (3) failure to insure a sufficient number of

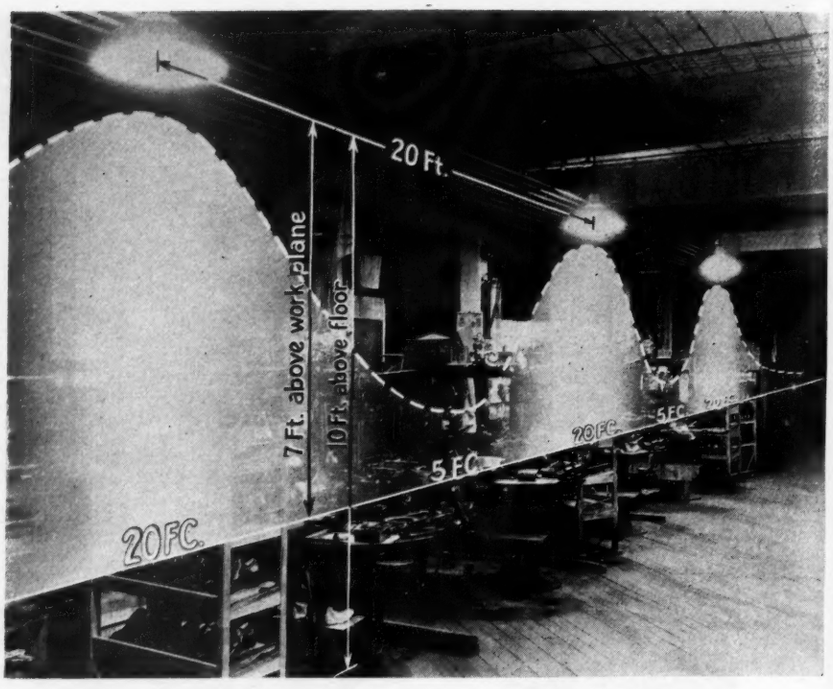
sources and (4) the use of local lighting with no general lighting.

3. Is Every Bulb Properly Shielded?

The reason for having various lighting equipments is to convert, as far as possible, raw, glaring, "negative" light into useful light. Within practical limits, the more useful the light a person has, the more he is able to see, and the more glare he has, the less he sees.

Glare does not necessarily mean too much light. Glare conditions often exist where there is too little light. It always signifies a waste, not only of light but of time and materials, since it interposes an obstacle to easy seeing. Worst of all, it raises the possibility of accidents because with glare seeing is subject to strain. The cost of glare, measured by the waste of foot-candles necessary to overcome reduced visibility due to glare, is shown by one of the accompanying photographs. At this machine a glaring local light has been used to supply a high level of illumination on the work. This glaring light causes the pupils to contract automatically, thus restricting the opening for seeing light to enter. In this case 60 percent of the useful light is wasted counteracting the effect of glare. If the lamp were removed 40 degrees from the line of vision, the loss would be reduced to 42 percent.

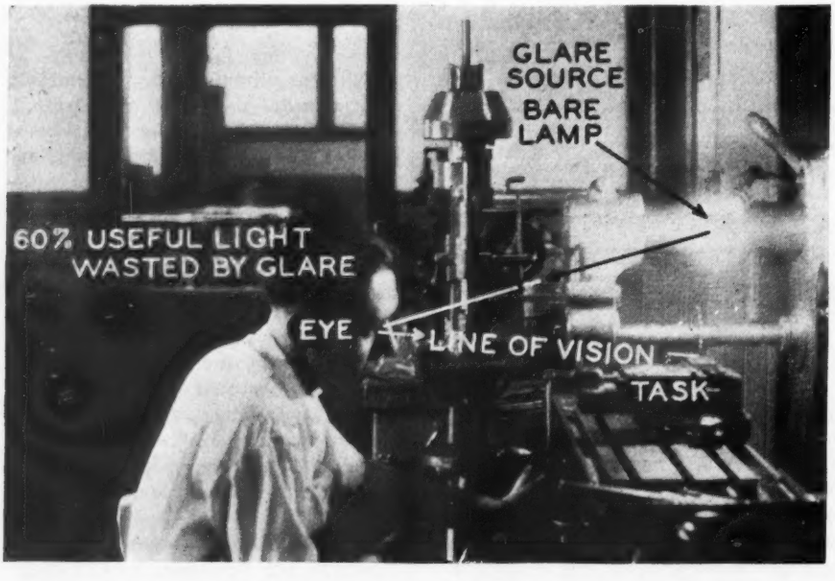
Similarly, reflected glare, that is, brightness reflected from shiny material, may prove even more annoying because the eye has no natural protection against it. Glare may result from (1) unshaded lamp bulbs, (2) lighting equipment which does not confine the light to the proper angle but directs an excessive amount to the eyes, (3) units with excessively high brightness at the angles reflected to the eye by shiny material and (4) improper location or adjustment of equipment which permits bright reflections of the source to reach the eyes.



Improper spacing results in spotty lighting with bad shadows. Such lighting penalizes workers unfairly because only those working directly under the units receive adequate lighting.

4. Is Local Lighting Ever Used Alone?

Local lighting of the concentrating type should always be used in conjunction with general lighting, otherwise contrasts will be bad and eye-strain likely to result. Everyone involuntarily glances away from his work at frequent intervals, usually for momentary relaxation. But if the contrast is too great, instead of being rested the eye rapidly becomes fatigued from the continuous adaptation of the retina and pupil to the widely different brightnesses encountered. Under average conditions a ratio of 10 to 1 in foot-candles is generally satisfactory. This means that for every 100 foot-candles of supplementary lighting provided, there should be a minimum of 10 foot-candles of general lighting.



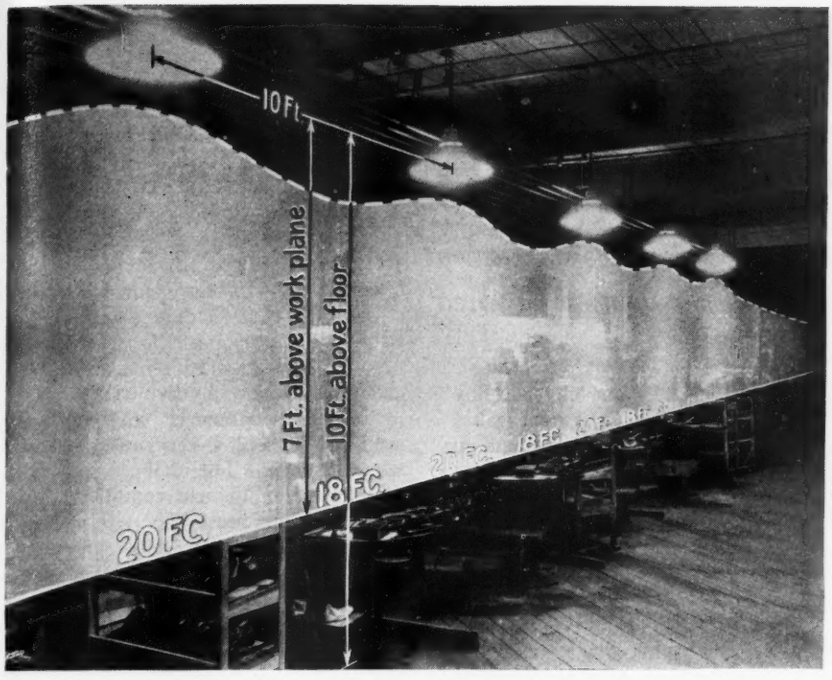
Glare is raw, uncontrolled light. The more there is the less one sees. As much as 60 percent of the useful light is wasted because this machine operator is using a bare lamp to provide "more light" on his work.

5. Are Right Kinds of Lighting Units Used?

There are a great many different types of lighting units available today, and each has certain features which recommend it for a particular type of work. For best lighting results it is essential that the right type be used.

For most operations the RLM Standard Dome reflector, a standardized product of a large number of manufacturers, is quite satisfactory. It should always be used with a white-bowl lamp when mounted less than 20 ft. high, otherwise the brightness will be objectionable.

The Silvered Bowl Diffuser and the Glassteel Diffuser units provide a better quality of lighting with fewer shadows. The latter unit has openings in the top which allow some of the



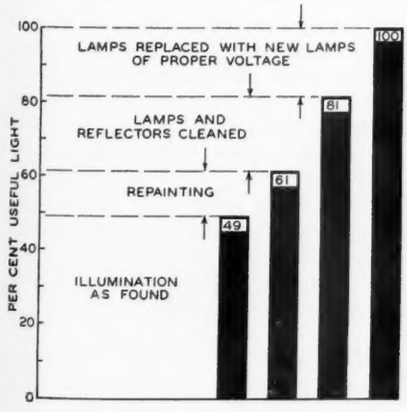
Reasonably uniform illumination not only eliminates dangerous shadows but also enables the utilization of every square foot of floor space for work tasks in the industrial plant.

light to reach the ceiling, thus giving the room a more cheerful, pleasant appearance than with the ceiling dark.

If the ceiling is high, the high-bay type of equipment should be used to insure maximum efficiency. These equipments have a concentrated distribution, consequently little light strikes the side walls where it may be absorbed and never reach the working area.

In granaries, flour mills and the like, special explosion-proof equipment should be used because the ordinary lighting unit might present a hazard.

For augmenting the general lighting over restricted areas, two types of supplementary units are available—concentrating and diffusing. The latter are referred to as large-area, low-brightness sources and are recommended for lighting tasks involving work on shiny surfaces. If concentrating type units are used for such work, there may be bad reflected glare resulting in poor visibility. In using concentrating sources, care should be exercised regarding their placement. A bench unit of the half-shade variety is frequently swung by the workman to a position where, although it does not annoy him, it may be exceedingly glaring to his neighbor. Mounted at the ceiling or on the sidewall and properly louvered, the unit produces less annoying glare. Being out of reach of the workmen, lamps so mounted are less likely to be tampered with and consequently remain properly aimed.



Striking improvements are obtained by repainting and cleaning lamps and reflectors. These data were obtained in a plant where conditions were unfavorable for maintenance.

6. Are Lamps of Proper Voltage Used?

Lamps are designed for a given voltage and, generally speaking, light is produced most economically when they are operated at that voltage.

A 115-volt lamp operating at 105 volts gives about 26 percent less light than at normal voltage. The wattage consumed by the lamp itself, burned 10 volts under rated voltage, is 13 percent less than normal. Hence a lamp burned at 87 percent wattage provides only 74 percent light, which is poor economy.

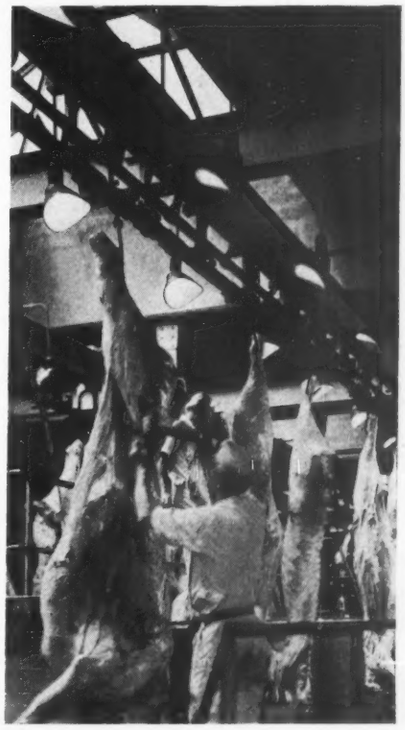
By checking the voltage at a number of sockets when the lighting load is on, the voltage of lamp to be used can be quickly determined.

7. Are Lighting Units Kept Clean?

Good maintenance means more light—and more light for the same operating expense. No value whatever is obtained from the light lost on dirty fixtures, walls or ceilings, so if this lost light can be obtained it amounts to very much the same thing as extra cash in the pocket.

In an average size plant illuminated with Glassteel Diffusers, having a ceiling and sidewalls with reflection factors of 30 and 10 percent respectively, repainting the ceiling so that it will reflect 80 percent of the light striking it, and the sidewalls 50 percent, will increase the illumination approximately 15 percent.

In an office lighted by indirect equipment where similar conditions might exist, using paint of the same reflective value would triple the illumination.



There are many different kinds of lighting units available today. For best results use the one that provides the desired quality and distribution of light, as is done here.

While repainting every few years can be justified economically, environment plays such an important part in the morale and productiveness of an employee that repainting should be done whenever the interior appears dirty or depressing.

Twelve Executives Answer The DRIVER-OWNER Question

Cite experiences and views on current problem of driver- versus company-owned trucks

SHOULD we own our trucks and pay the drivers increasing wages, or sell the trucks to the men and hire our delivery done on a contract basis? That is a problem which has been posed for food fleet operators by higher wages and troublesome unions.

Here's the problem as presented by one of FOOD INDUSTRIES' subscribers:

"I have a choice of selling my trucks to the drivers or signing a union contract.

"My line is manufacturing freshly prepared foods, such as potato and other salads, fishcakes, chicken pies, chop suey and a line of pickles, olives, relish and mayonnaise. My business is so seasonal that it is very difficult to establish a fair rate, that is, one that will provide drivers with a living in the winter and not overpay them in the summer. For instance, they need close to 20 percent on $300 to cover expenses and their salary, but the same route will give them $500 weekly in May and $600 in June."

This food company's problem was put up to several executives in the food industries, and their comments as to what should and should not be done follow:

★ *As a dairy executive in California sees it:*

"I have had considerable experience in the distribution of food products where the driver owned his own truck. At the same time, these agreements were such that I did not lose control of my business. If the right kind of an agreement is drawn, this can be done and you can actually build business except in certain territories where practically all people are members of a union.

"The most important point in operating a driver-owned truck system is the selection of the right kind of men. A man who is ambitious, who wants to get ahead and who is capable mentally and physically of conducting a small business will succeed both for himself and for the owner of the business.

"My program generally calls for my company to buy the truck for the individual and arrange with the bank for a loan to the individual to buy the truck, and the individual takes care of the interest and a payment on the business each month. This gives the man a reasonable amount of business, helps him develop credit and relieves owner of the business from being in a compromising position with his driver. Sometimes I have found it necessary to extend a favor to some of my drivers by making a small loan for a week or two so that they can keep their credit at the bank in good standing, and, while it isn't generally known, we guarantee the payment to the bank so that the bank is willing to offer the men rather liberal credit which enables them to develop their business without too great a cost. In fact, the contracts which we enter into are quite comprehensive, but I know of many instances where men have actually doubled their incomes without penalizing our company. Of the men who were among the first to enter this kind of arrangement, all now own their own equipment and operate the route as though they owned their own business. I think the plan is very American and offers young men—especially young college men—an opportunity to get into business which they would not otherwise have.

"In a few instances some of the drivers have joined the unions themselves, but they so conducted their time and their union affiliations that it caused no inconvenience, and practically all who joined secured more business which they could not otherwise have secured, and which more than paid for the cost of belonging."

★ *The president of a dairy in Florida sees it differently:*

"I have had very little experience with driver-owned trucks, but what experience I have had with them proved to me to be very unsatisfactory for us. On paper, it works out very well, but in actual practice it is nothing but a headache for the company.

"The drivers become very independent, and you have practically no control over them. They get independent with the trade and offer all kinds of prices so as to secure an account. They are not reliable deliverymen when they own their own trucks, and any way you put it, it is a very unsatisfactory arrangement. The drivers generally do not have sufficient capital to carry their accounts receivable, although our arrangements were that settlements would be made daily or at least once a week. But since the driver does not have sufficient capital, he gets under your skin, and the first thing you know he will owe you several hundred dollars which is impossible to collect.

"If the food executive who asked for advice on this problem should decide on the driver-owned trucks, he should try to get a good substantial cash security from each man, because I am sure he will need it as time goes on."

★ *What a Minnesota bread company executive thinks about it:*

"We operate 14 routes which have driver-owned trucks, and we sell the drivers our products at a regular discount. We find this system very satisfactory in outlying districts.

"Prior to this arrangement, our company owned its own trucks, and in quite a few instances we found it was impossible to operate, as we did not have the driver and truck under the direct control of our plant and thereby ran up a lot of uncontrollable expense, such as high operating costs on trucks. We also had some difficulty with salesmen handling their customers properly in regard to merchandising, and so forth, and we found that when the driver owns his own trucks he is more careful about his accounts and operates his truck more economically than when it is company-owned.

"All of the routes that are pulling out of our plant are company-owned, and we find this very satisfactory as we have daily control of all salesmen as well as of our trucks."

★ *And here's the opinion of the assistant to the director of traffic of a milling company in Minnesota:*

"If interstate transportation is involved in the operations of the company seeking information on driver-owned trucks, or if the particular state in which the company is located hap-

pens to require certificates or permits for contract operators, then it would appear to us that these angles should be taken into consideration before a decision is reached as to the desirability of using driver-owned contract carriers or private-owned trucks with the drivers members of the union.

"If the men who are now driving the trucks for the particular operator are satisfactory and the relationship between the company and the drivers has been wholly satisfactory, it would seem reasonable to assume that such a relationship would continue even though the drivers are members of the union. If the relationship has not been satisfactory, it would appear that the selling of the trucks to the drivers with the necessity of negotiating separate contracts with each driver would not improve the situation."

★ *How it looks to the general sales manager of the milk department of a Pennsylvania dairy:*

"The experience we have had with driver-owned trucks has been in a territory where we had been operating and for various reasons decided to turn this over to the driver. This has not worked out as satisfactorily as we had hoped. In other words, it makes the driver a jobber, and you lose considerable control of supervision as well as the good will formerly established.

"Does the company facing the problem of driver ownership employ driver salesmen, or are they just haulers? This would make considerable difference. I believe if they were just haulers, I would sell them the trucks on a short contract hauling basis, but if the driver has to act as a salesman and agent for the company, then I would consider this very carefully. In either event, you lose a certain amount of control that you formerly exercised over these men."

★ *A new angle is considered by a Pennsylvania bakery president:*

"In some states the fleet operator going over to driver-ownership might still be liable to compensation and old age benefit taxes although the men are no longer on his payroll. In this area he would accomplish nothing by selling the trucks as, the union would require the men to join anyhow as individuals and he would have to deal with union conditions the same as if he owned the trucks."

★ *Advice from the vice-president of a Tennessee bakery:*

"If the trucks in question are to be used like bakery trucks by driver-salesmen, I would say that there would be some difficulty possibly in light of the new wage and hour law. That law, if the party is doing interstate commerce, would prevent the manufacturer or operator from exercising any supervision over these trucks and their operation. However, I do know of many instances of so-called agents or 'bob-tailers' who are doing a good job for bakers, especially where the operations are covering a wide field, where little supervision is required and where the trucks could not be brought into a central station for maintenance."

★ *The treasurer of a New York dairy would avoid unionization:*

"If a food company's truck drivers are not unionized, it should try everything in its power to avoid it. If I had my choice again, I would not, under any circumstances, own my own trucks if I could sell my routes or work my routes on a commission basis. That is to say, the driver owns his own truck, and if he were a good man, although he did not have the money to pay for the truck in cash, I would give him time to pay for same. I think it is a much better way than to lose your freedom on unionizing."

★ *Various methods tried by this dairy president in Washington, D. C.:*

"I have had considerable experience with both company-owned equipment and driver-owned equipment, and we have also had contracts with other service companies making deliveries for us. In our business, where there are many conditions incidental to delivery, such as temperature control on products while in transit, time factors for delivery and the knowledge the delivery men must have of our business, we favor the company-owned delivery service. We have one contract at present in another city where an outside company owns the trucks, but we employ the drivers so they may be under our direction and supervision."

★ *The general manager of another California dairy expresses his views:*

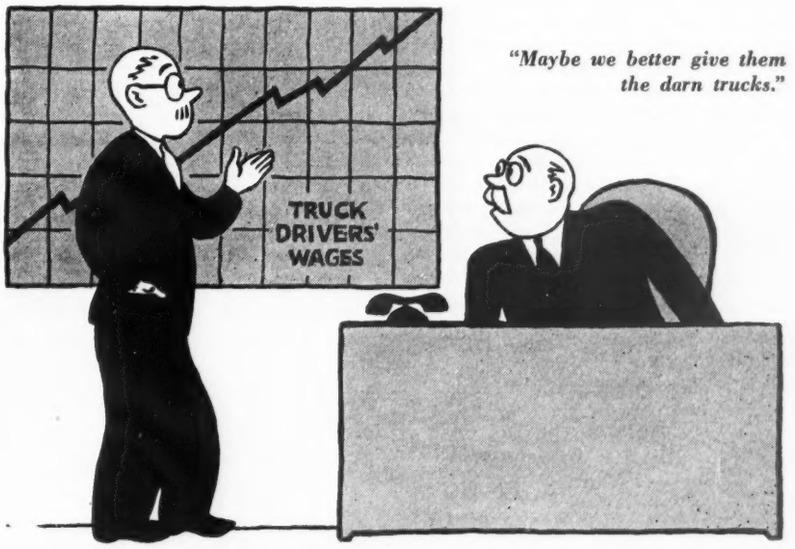
"At one time we switched all our company retail trucks to driver-owned trucks, and although it was quite a job to switch over the results were very satisfactory. Our business increased considerably and the men displayed more interest in their routes.

"Although we did not make as much money under the driver-owner system as under the other system, our business increased very materially. We had less turnover under the driver-owned business than with company employees.

"Unfortunately, the union came into our area, and after organizing the major milk companies they worked on the independent milk companies. And as we are one of the few independents in our market, they made a drive on us and it was only a short time until we had to take back our trucks."

★ *The president and treasurer of a New York beverage company puts in word for driver-owner:*

"We do considerable business with truckers who own their own trucks, and comparatively speaking, results have been more satisfactory than with operators with fleets."



"Maybe we better give them the darn trucks."

★ *The treasurer and general manager of a Rhode Island beverage company says:*

"Personally, I do not think it is a good business proposition to sell trucks to the drivers, for by so doing you will ultimately lose control of your distribution and delivery."

Packaging for PLUS SALES and PRESTIGE

Special packages open select markets, build good will and get new customers

By IVAN C. MILLER
Distribution Editor, FOOD INDUSTRIES

Four years ago, by direct mail and word of mouth advertising, Chazy Orchard, Inc., Chazy, N. Y., began to distribute the output of the world's largest McIntosh orchard. Chazy McIntosh apples are given special culture to produce select fruit, which is picked at the proper degree of ripeness and immediately placed in cold storage. From the cold storage stock are selected for each direct-mail delivery those apples which will be in perfect condition at the time of arrival. In order to assure a market for a product of this quality and to be sure that apples when they reached the customer were of this quality, it was necessary to sidestep retail store distribution in favor of speedier direct delivery. This required special packaging. Selected apples, each surrounded by corrugated board, 36 to the carton, and a carton of apples with a centerpiece of bottled honey are offered for mail delivery throughout the year. During the holiday season a holiday-wrapped package is available. Today much of the output of the world's largest McIntosh orchard is sold and delivered specially packaged by direct mail.

THE major packaging problem of most food manufacturers is packaging for year-round sale to the mass market. Some food products, however, can't crash the mass market. These must be packaged to qualify for the patronage of a narrower selective market. There are also other conditions or occasions which require special or selective packaging. There is packaging to induce the purchase of assortments, packaging for the safe delivery of direct-by-mail purchases and packaging in cases where the product or products are to serve a special purpose other than moving through the regular channels of distribution.

Packaged assortments of products of many food manufacturers offered at retail during appropriate seasons have not only materially advanced immediate sales but also stimulated sales over a long period. New customers have been gained for many of the products in the packaged assortments which have moved through one channel of distribution or another to the consumer. Whether the special package itself or a price consideration of the assortment constituted the impulse inducing purchase, or whether the products were consumed by strangers to the line or by those familiar with the products, the result has been new customers for many of the products in the assortment.

A new package, an attractive package, a "bargain" package and a packaged assortment usually react favorably on retailers and retail clerks to the extent of obtaining feature displays for such products and also enthusiastic recommendation to customers.

Assortments are not always packaged to sell through retail outlets. They may be packaged to serve other uses. Some food manufacturers, those with small organizations, limited stockholders and few products, use a specially packaged selection or assortment of company products as a remembrance to employees and stockholders in celebration of company anniversaries or during the holiday season. Food manufacturers have often found it profitable to send an assortment of company products to stockholders, many of whom frequently

H. J. Heinz Co. this year is offering several gift assortments. Among them are an assortment of 12 of the 57 varieties packaged in a brown Morocco leatherette magazine rack and an assortment of 12 in a picnic hamper, packed in shredded transparent cellulose. These gift assortments are suggested as appropriate gifts to mothers, relatives, friends of the family or business acquaintances. They are also suitable as gifts to be distributed by employers or lodges. However they may be distributed, by whom or to whom, these assortments represent large unit sales which will be widely distributed, netting immediate plus returns and building new users.

have little knowledge of the products manufactured by companies whose stocks they hold. Results have proved that enthusiastic sockholders can have a stimulating effect on retailers and consumers alike.

Several manufacturers use a special package of selected company products as an advance agent in opening new territories. One company uses the sample assortment as the salesman's calling card. Another company mails an assortment to retailers' homes just before salesmen enter new territory.

There is another very important use of the assortment. For this use an assortment of company products is packaged to sell as near as possible at cost to employees and stockholders. For a number of years one manufacturer of a variety of food products has found it profitable before the holiday season to offer to employees and stockholders at cost or slightly below a selection of company products packaged as a unit in one corrugated carton. Each year the company prepares to handle many thousands of orders to be delivered by the company anywhere in the 48 states. At first the gift assortment was packaged in a stock corrugated carton in which one of the company's items was regularly shipped. The advantage of using a stock carton was the elimination of any possible loss from left-over cartons specially designed or prepared for the holiday assortment.

One year the company deviated from its policy to invest in a slightly more expensive special outer carton, festively decorated, returning to the use of the stock carton the following year. Remonstrances from stockholders and employees permanently reinstated the special festively decorated outer carton. This is but one of many instances which recommend the selection of special packages for special uses.

This company's records (as do those of other companies) provide ample evidence of the value of the specially packaged assortment offered to employees and stockholders at or below cost. The dividends have not been restricted to improved relations with employees and stockholders. There is proof that this plan of offering an assortment to employees and stockholders has widened distribution and brought many new customers. There is evidence also that old customers, familiar with but a few of the company's products, have become customers for a greater variety of items, all of which has improved sales.

Many instances resulting from distribution of this type of packaged assortment indicate its value. In one year's assortment a product distributed by one company in only a limited area was included in the assortment offered to employees and stockholders. Shortly after the holidays letters poured in from areas outside the limited area in which the product had distribution. These letters asked where the product could be purchased. To satisfy the demand the company supplied on order small bulk shipments direct in areas without retail store distribution. This type of shipment accounted for a profitable sales volume increase. The retailers in the territories where the product was not in distribution received requests and inquiries from those who wanted to buy the product, thus paving the way

Each of the last few years P. J. Ritter Co. has placed larger orders for "Ritter Sampler" cartons in which an assortment of its products are merchandised. This specially packaged assortment, thousands of cartons of which are sold to business firms over the country to be distributed by them as gifts to employees and friends, has not only increased immediate sales but has brought greater acceptance for the lesser as well as the better known items in the assortment.

Each year, six weeks or so before the holiday season, General Foods Corp. offers stockholders and employees the opportunity to purchase an assortment of General Foods products packaged in a special gift carton. Besides the assortment of food, the gift package contains a non-food gift item. This year's gift package contains a roast holder for broiling or baking. The assortment, offered at cost and delivered by the company, makes a desirable gift if the annual sales volume is any index. These gift assortments, shipped all over the country, improve company relations and also create many new customers for General Foods' products.

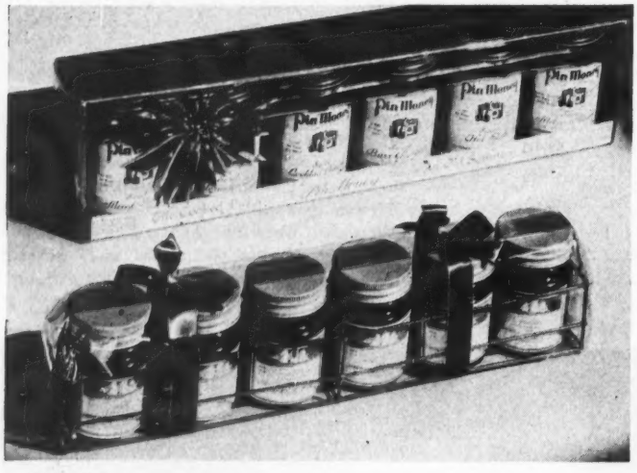
for retail distribution in new areas. Assortments purchased by employees and stockholders and distributed as gifts to friends and relatives provide at minimum cost a form of sampling with little waste circulation.

Few businesses there are that do not have persons with whom it is essential to maintain friendly relations. Among these are brokers and jobbers, producers and distributors of raw materials, professional people, municipal or government employees and publishers. The selection of a remembrance to such friends of a business is difficult and even at times embarrassing. Such a remembrance should be appropriate, but should never be sent when the intrinsic value permits its acceptance with any misconception. Not a few food companies have solved this problem through the use of a special gift package of their own products. This has proved advisable even when the number of recipients of such a remembrance is exceedingly small.

Today's huge volume of direct-mail sales owes thanks in general to the food industry, specifically to Frank E. Davis Co., Gloucester, Mass. This company built the first large mail-order business in this country, selling fish, principally salt mackerel in wood buckets, from coast to coast. Since then many foods have acquired profitable distribution through mail orders when all other types of distribution have failed. Packaging such products, unusual foods or those of top quality, requires special packaging treatment, either to protect the contents against severe handling during shipment or to meet the package requirement necessary to indicate the quality of the contents. The possibilities of mail-order distribution of foods have not been exhausted. This method of distribution offers opportunities for unusual foods and those of top quality which have not found a profitable market when regularly packaged and sold through regular channels.

Grocery stores, department stores and gift shops have moved profitable volumes of food products, both labeled and unlabeled, in assortments, including national brands and private brands, by packaging them in appropriate and attractive containers or packaging material. Most retail food outlets, however, leave special packaging to the manufacturers. The results obtained from those manufacturers who have adopted reasonable special packaging for special uses indicate the value of such packaging.

Here are two assortments packaged as gifts, one a group of imported English jams, the other a selection of relishes. "Pin Money" relishes, products of Pin Money Brands, Inc., Richmond, Va., are sold through retail outlets. The assortment, in a colorful container wrapped with transparent cellulose, increases unit sales and introduces the product to new users.



This very attractive 5-lb. box of "Imperial Clusters" of raisins tied with colorful ribbon is not a gift box in the accepted sense. Instead it is a complimentary package of raisins sent to a very select few, numbering no more than 150 in the United States, Canada and England. These raisin clusters are specially packaged to serve a special purpose.

Ten 12-oz. non-deposit bottles of "R & H Premium Beer," product of Rubsam & Horrmann Brewing Co., Staten Island, N. Y., were packaged in a holiday-decorated corrugated carton. The distribution was local, confined to the island. Retailers willingly stocked the gift package and readily moved the stock to the trade well before the season ended.

Bedford Products, Dunkirk, N. Y., has found a profitable and unusual market for a group of jellies made from both wild and domestic fruits and berries. These jellies are packaged in a special gift package, sold to contractors and other executives and delivered direct to each executive's mailing list. This has proved more productive than retail distribution.

This article on

A NEW PROCESS

Is of interest to

All Food Manufacturers

Because it reveals the nature and significance of another development in food technology. Such developments are coming at an accelerated pace, and food manufacturers must keep up with the times or suddenly find themselves behind the industrial "eight ball." —The Editors.

ONE QUART NET
RICOLA
PURE OLIVE INFUSED
SALAD OIL
PURE CORN OIL SPECIALLY PROCESSED WITH GENUINE SELECTED IMPORTED OLIVES TO DEVELOP FINE OLIVE FLAVOR

Pure olive-infused salad oil manufactured by American Maize-Products Co. will be distributed to the Italian trade in this country by George Sirota & Co., New York.

Makes "OLIVE OIL" From CORN

Flavor of olive imparted to corn oil by new process, at low cost

GREAT BRITAIN'S blockade has bottled the Mediterranean, and if rigidly enforced will seal in most, if not all, of 7,000,000 gal. of olive oil annually imported into the United States. Although our consumption of all edible oils and fats is approximately 750,000,000 gal., more than 100 times the consumption of olive oil alone, some people in this country, especially Italians, consider olive oil a "must" food. The California olive groves can produce approximately 300,000 gal. of edible oil, only about 4 percent of the country's olive oil requirements.

This apparent potential shortage of olive oil need never become a reality because of a process now used by American Maize-Products Co., based on patents Nos. 2,069,265 and 2,199,-364, assigned to Musher Foundation, Inc., New York.

This process, through infusion, imparts the odor and flavor of olive oil to highly refined, odorless, tasteless corn oil. And the process produces between 30 and 40 times as much olive flavored oil as the amount of edible oil which could be extracted from the olives used in the process.

Ripe olives, partially dehydrated by packing in layers of salt, are reduced to about 20 percent moisture content. Then the olives are ground, with or without pits, to a fine pulp in the presence of a small amount of corn oil. This paste is then mixed with refined corn oil and passed through a colloid mill which brings the finely divided meat of the olive into intimate contact with the corn oil. The mixture is then filtered through a press to remove the undissolved olive solids.

The resultant infused oil, more than 90 percent corn oil, has the flavor and odor equivalent of the best imported olive oil. Furthermore, due to the fact that the meat of the olive contains antioxidants which are released to the corn oil during the infusion process, the keeping qualities of the corn oil are extended as much as three to four times.

Blending of olive oil with corn oil or other refined, tasteless vegetable oils does not produce an oil equivalent to imported olive oil. The oil expressed from the olive in the usual manner leaves behind in the cake residue most of the substances which produce odor and flavor. Infusion of the olive meat in colloidal form into corn oil imparts to the corn oil all the odor and flavor producing elements in the olive meat.

The cake residue left after olive oil is expressed in the normal manner contains much of the pro-vitamin A, or carotene. This vitamin, normally lost in the residue cake, is imparted to the oil resulting from the infusion process.

This process not only produces an olive oil equivalent, high in vitamin A, which can be produced in quantities sufficient to supply domestic demands from domestic produced corn oil and California olives, but it produces the olive oil equivalent at a cost which permits marketing at a price lower than that of imported oil. This process promises to make this country independent of imported olive oil not only during the war, but after as well. In so doing it would increase the consumption of domestic corn oil by approximately 40 percent.

TREATED SPICES Reduce Spoilage

Studies carried out on fresh pork sausage show that, when treated spices are used, the product withstands spoilage for a period at least one-third longer than when untreated spices are employed

By HAROLD W. SMITH
Bacteriologist, McCormick & Co., Baltimore, Md.

AFTER nearly two years of research, McCormick & Co. has introduced to the manufacturer and consumer of food products spices which have been subjected in a vacuum process to ethylene oxide gas in order to reduce markedly the numbers of living bacteria, yeasts, molds and other organisms. These, if left in their original numbers, are able to cause various types of food spoilage. Their removal has produced treated spices of special value for food manufacture, now marketed as "McCorized"* spices.

The question may be raised whether the natural antiseptic powers present in spices are sufficient to control microbial contamination on the spice and possible spoilage in spiced food products. Numerous workers have investigated the problem of the antiseptic value of spices and spice oils. James[1], in 1931, published a thorough review of the problem, and his tests indicated that although some spices do exhibit definite antiseptic powers against test organisms, the quantity of spice necessary is far in excess of that used in the preparation of food products. It has also been shown that spices themselves are subject to tremendous contamination by bacteria, many of which are of recognized spoilage types.[2] In 1937, Cameron[3] reported to the National Canners Association convention a wide variation in the bacterial content of certain species. A year later, Yesair and Cameron[4] published the results of their attempts to sterilize spices. They obtained better than 99 percent reduction of total bacteria and also substantially reduced the spore count by exposing the spices to fumes of ethylene oxide.

* The term "McCorized" is a trade name reserved by McCormick & Co. for its products which have been treated in a vacuum process to destroy as many as possible of bacteria and other living organisms that cause certain types of food spoilage.

All that then was needed to test the value of microbial reduction in spices were practical experiments designed to demonstrate the efficiency and desirability of bacteria-reduced spices in manufactured food products. Jensen, in 1934[5] reported: "With trimmings free from carbon dioxide-forming bacteria, sterilized spices, and microbially clean wrapping paper, a spiced ham may be produced with the nitrate-nitrite sugar cure that will not swell at 37.2 and 48.9 deg. C." Hall[6], more recently, included in a report on sterilized spices a mention of experimental work on fresh sausage which indicated that sausage made with treated spices kept materially longer under normal storage conditions than sausage prepared with untreated spices. The laboratories of McCormick & Co. concentrated their efforts on that type of research, attempting work of a sufficiently practical nature to test the value of the new "McCorized" spices when incorporated in a perishable food product.

Three sets of experiments were run to determine the value of using treated spices in pork sausage (or other meat) as a means of increasing the safe holding or storage period of the product. Treated and untreated spices were used at a local meat-packing plant in the manufacture of two otherwise similar lots of fresh sausage. These then were stored at various temperatures and periodically examined for bacterial spoilage and cooking quality.

In preparing the samples, approximately 500 lb. of salable pork was ground and prepared in thoroughly cleaned equipment and was seasoned in the accepted manner with blended ground spices. One portion of the meat was seasoned with treated spices, the other with untreated spices. Both portions were then stuffed into fresh hog casing and 10-lb. samples of each lot placed in storage at various temperatures.

Samples of the fresh meat containing no spices, of the casing and of the several ingredients such as spices, salt and sugar were also collected and examined bacteriologically. The results of tests on the materials used are shown in the accompanying table. It should be noted that the ground meat without spices contained somewhat excessive microbial contamination at the start of the experiment. The casing was also of only fair bacterial content; but spices and other savoring agents were either free from contaminant or of low count.

The samples of the prepared product were divided into three equal parts, and one portion was stored at 34 deg. F., one at 42 deg. F. and the third at 68 deg. F. These temperatures were selected since they nearly approximate those in a packing plant

Microbial Contamination in Ingredients and Sausage Before Storage
(Total numbers of organisms per gram)

	Aerobic bacteria	Yeasts & molds	Putrefactive bacteria
Ground nutmeg			
Untreated	7,700	3,850 (molds)	0
Treated	0	0	0
Ground white pepper			
Untreated	9,300	3,400 (molds)	10*
Treated	0	0	0
Salt	0	0	0
Sugar	0	0	0
Casing	433,000	100 (molds)	100
Ground meat containing no spices	2,800,000	0	1,000
Sausage containing spices	1,300,000	0	1,000

* Reciprocal of dilution showing positive growth.

Front and back labels of containers used by McCormick & Co. for the new "McCorized" spices, treated to destroy organisms that might cause spoilage in food products into which the spices enter as ingredients.

cold room, in a household refrigerator or a display case, and room temperature, respectively. Throughout the storage period, bacteriological tests were made to determine total aerobic bacteria, yeasts, molds and putrefactive anaerobic bacteria in both the meat and the casing.

The results of sausage storage in ordinary trade are believed to be fairly represented by those obtained during the course of the experiments. Marked bacterial growth occurred in every sample at each storage temperature. This is to be expected in view of the large initial contamination in the meat itself, and is true of most commercial sausage.

No molds developed sufficiently to show up on the agar plates. Yeasts were evidently present in small quantities at the time of manufacture, but by the time the sausage was three days old they had increased to more than 1,000,000 per gram at all three storage temperatures. Since the yeasts must have been initially present only in the meat, no difference between the lots would be expected.

At 34 deg. F., over a period of 21 days, putrefactive anaerobes were present in increasing numbers, varying from 1,000 to 100,000,000 in the untreated sample and from 1,000 to 10,000,000 in the treated sample. At 42 deg. F., over a period of 25 days, the counts varied between 1,000 and 10,000,000 for both untreated and treated samples. At 68 deg. F., the sausage containing untreated spices was rotten within five days and so was not tested further; whereas that made with treated spices lasted for eight days. Within these periods the former reached an anaerobic count of 100,000,000 per gram and the latter a count of 10,000,000.

Observations were made on the physical appearance of the sausage samples under the various storage conditions, with the following results:

Storage at 68 deg. F.—No appreciable change took place in either sample for the first five days. After six days of storage the sample containing untreated spices showed spots of slime and mold growth on the casing. It was badly discolored, gave off a foul odor and was considered to be definitely putrid. After seven days, the sausage containing treated spices had a disagreeable, but not foul odor. There was no discoloration, but mold growth had started on the casing. At the end of nine days spots of blue-green and yellow molds were numerous on the casing, and it was considered to be definitely unpalatable.

Storage at 42 deg. F.—No noticeable change took place in either sample for ten days. On the eleventh day, both samples had developed off-odors. A few molds appeared on the casing of the sausage containing treated spices and many on that containing untreated spices. The casing of the latter had a decided greenish tinge.

Storage at 34 deg. F.—For the first ten days no change in either sample could be observed visually or by smell. On the eleventh day a slight off-odor was detected in both samples. The casing of the sample containing untreated spices showed a slight discoloration.

During the course of the experiments, samples were taken from each lot, the meat removed from the casing, formed into patties, fried and tasted by judges who did not know the identity of the samples. Color, odor, texture and flavor were considered, and the judges were in almost perfect agreement in every test. It was found that at 34 deg. F. storage some of the sausage containing untreated spices carried an off-flavor after only seven days and in no case retained a savory flavor longer than 12 days; whereas the sausage containing treated spices was still entirely palatable after 14 days of storage. At 42 deg. F., a similar difference in taste was very noticeable after approximately one week of storage. Also the sample containing untreated spices was always decidedly stale or rancid after one week of storage, whereas only a slight loss of flavor could be detected in the sample containing treated spices.

The cooking tests were considered to convey as much significance regarding the value of treated spices as any other phase of the experiments. Since the bacterial counts were so extremely high throughout the storage periods, they do not furnish as significant an index of spoilage as might be desired. However, by organoleptic tests different degrees of spoilage could be detected, even when bacteriological examinations failed to show a difference.

One general conclusion is drawn: The difference between the sausage containing treated spices and that containing untreated spices was essentially the same in each of the three sets of experiments. Sausage containing treated spices exhibited a definite tendency to withstand spoilage for a period approximately one-third longer than sausage containing untreated spices. It is believed that even longer holding periods may be obtained with other less perishable spiced meat products, especially those made with meat and materials not so highly contaminated at the start as are typical sausage meat and casing.

References

[1] L. H. James, Just How Antiseptic Are Spices? *Food Industries* (Dec. 1931).
[2] L. H. James, Reducing the Microbial Content of Spices, *Food Industries* (Aug. 1938).
[3] E. J. Cameron, Report on Meat Canning Problems, National Canners Association Convention, Chicago, 1937.
[4] J. Yesair and E. J. Cameron, Present Status of the Sterilization of Spices, *The Canner*, Convention Number (Feb. 26, 1938) pp. 108–110.
[5] L. B. Jensen et al, *Industrial and Engineering Chemistry* 26, 1118, 1934.
[6] L. A. Hall, Sterilized Spices: New Factor in Food Quality Control, *Food Industries* (Aug. 1938).

Effects of Storage On Microbial Content of Spices

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NUMBERS of microorganisms in spices are greatly reduced by a method which employs the use of ethylene oxide gas under controlled conditions.[1,2] The results reported by James showed that there is a marked reduction in bacterial numbers immediately after exposure to the treating process. The fate of the remaining microorganisms in the spice was deemed to be important in its relation to the manufacture of spiced foods. Furthermore, since spices are marketed in non-hermetically sealed containers, the porosity of the container and the "breathing" process introduces a chance of recontamination.

When the materials for the original work done by James were arranged, duplicate sets of both untreated and treated samples were prepared, and tested after packaging and after 20 months of normal storage. This storage time was much longer than most packaged spices might be stored before reaching the consumer. It was considered sufficient to permit any probable recontamination.

These samples have been tested for total numbers of microorganisms. Nutrient agar was used for determining numbers of total bacteria, and malt agar for cultivation of molds and yeasts, the same for the original determinations. The table shows results obtained immediately after treatment and after storage.

In noting these results, it must be remembered that no two portions of the same package of a dry food product are likely to yield identical bacteriological data, since the microbial flora usually is not divided equally over a given area. Consequently, some variation between duplicate samples is to be expected. The results may safely be interpreted either on the basis of marked variation or through general trends toward an increase or decrease in microbial numbers in the majority of samples.

Of the 55 duplicate untreated or control samples, 40, or 72.7 percent, showed increases in the numbers of total aerobic bacteria after 20 months storage; eight, or 14.5 percent, had lower total bacterial count after 20 months; and seven could not be compared. It is of interest to note that all untreated whole spices showed an increase in total bacteria, with the exception of whole nutmeg and whole mace. Of the ground spices, nutmeg again showed a characteristic decrease in total bacterial numbers, as did cinnamon, leaf sage, cardamon and onion salt.

Of the 55 duplicate treated samples examined bacteriologically after 20 months storage, 31, or 56.3 percent, showed a decrease in total aerobic bacteria; and 17, or 30.9 percent, showed an increase. But seven samples of these 17 showed only a moderate increase, in all probability due to variation within the sample. Five samples remained the same, and one sample could not be compared. It becomes evident, then, that even after 20 months storage the effectiveness of treatment is still evident.

Immediately after treatment, 46 of the 55 treated samples, or 83.6 percent, had shown 100 percent reduction in yeasts and molds. After 20 months storage, 42, or 76.3 percent, still showed 100 percent reduction. The duplicates of the nine samples which had not shown 100 percent reduction

(*Turn to page 72*)

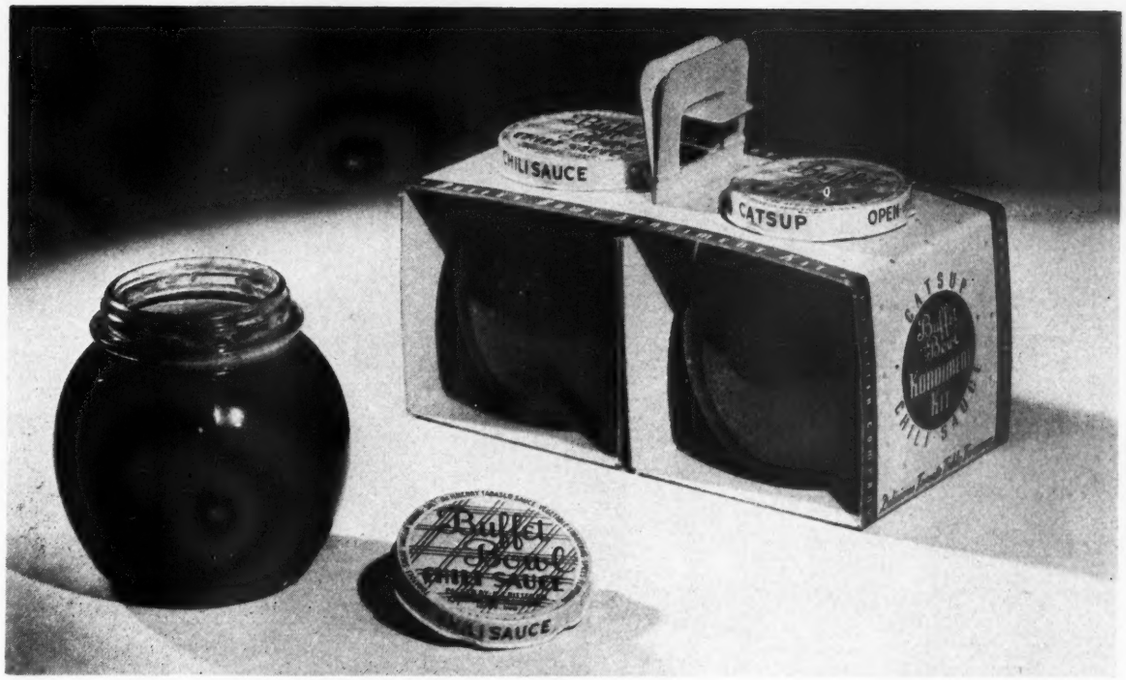
Comparison of Microbial Numbers Present on Samples of Treated and Control Spices Immediately After Treatment by Ethylene Oxide Method with Numbers Present on Duplicate Samples After 20-Month Storage.

Spice	Total bacteria (per gram) Control	Treated	Molds and yeasts (per gram) Control	Treated
Whole black pepper.	T.N.T.C.*	200	T.N.T.C.	0
	10,450,000	540	400	0
Whole dill seed.....	32,000	0	1,600	0
	300,000	10	950	0
Whole cloves.....	600	0	400	0
	36,000	0	0	0
Whole rosemary....	4,000	0	8,300	0
	9,000	10	50	0
Whole cassia.....	18,000	0	100	0
	76,000	800	6,000	0
Whole anise.....	16,000	200	700	0
	18,000	0	70	0
Whole ginger.....	700	300	0	0
	Less than 1,000	1,450	0	10
Whole allspice.....	10,000	0	7,500	0
	295,000	2,750	0	0
Whole s. marjoram..	53,000	300	4,500	0
	305,000	70	2,400	0
Whole coriander....	600	200	0	0
	1,355,000	9,000	4,800	0
Whole savory.....	45,000	0	4,600	0
	156,500	10,000	1,500	0
Whole caraway.....	1,300	300	0	0
	2,000	100	0	0
Whole thyme.....	35,000	200	5,000	0
	210,000	0	11,000	0
Batavian stick cinnamon.....	7,000	0	2,300	100
	22,000	0	0	0
Whole celery.....	320,000	800	T.N.T.C.	0
	3,650,000	10	556	0
Whole mint.....	200,000	8,000	100,000	100
	386,000	300	2,060	0
Whole nutmeg.....	3,000	2,500	0	0
	Less than 1,000	30	0	0
Whole mace.....	9,000	200	400	0
	1,000	0	0	0
Whole cumin.....	95,000	200	15,000	0
	3,300,000	1,900	205	10
Whole red pepper...	1,500	0	600	0
	3,000	255	10	0
Whole white pepper.	7,000	200	14,000	0
	9,500	0	3,200	0
Whole mustard.....	3,300	2,000	400	370
	23,000	0	20	10
Cream tartar.....	100	0	0	0
	0	0	0	0
Curry powder.....	T.N.T.C.	800	35,000	400
	4,750,000	460	1,000	0
Allspice.....	70,000	200	T.N.T.C.	100
	980,000	0	1,400	0
Nutmeg.....	53,000	2,800	11,000	2,300
	8,000	0	345	0

Spice	Total bacteria (per gram) Control	Treated	Molds and yeasts (per gram) Control	Treated
Black pepper.....	1,400,000	4,000	4,100,000	0
	29,000,000	1,100	220	0
Turmeric.....	95,000	2,000	56,000	0
	1,950,000	6,000	0	0
White pepper.....	80,000	2,300	80,000	0
	226,000	0	130,000	0
Cinnamon.....	28,000	300	1,500	0
	10,500	0	0	0
Mustard.....	8,000	900	0	0
	100,000	200	0	0
Ginger.....	T.N.T.C.	3,000	72,000	0
	13,600,000	Not tested	170	Not tested
Fennel seed.....	10,000	500	0	0
	62,500	9,230	285	0
Ceylon cinnamon...	21,000	400	0	0
	33,500	590	0	0
Saigon cinnamon...	11,000	400	0	0
	83,000	100	0	0
Leaf sage.....	2,400	700	0	0
	Less than 1,000	0	0	0
Crushed red peppers.	T.N.T.C.	5,000	10,000	0
	7,450,000	0	1,750	0
Sage.....	13,000	1,000	1,100	100
	28,500	0	140	10
Cardamom.....	1,500	6,000	0	0
	Less than 1,000	300	0	0
Paprika.....	25,000	500	0	0
	1,300,000	0	0	0
Chili powder.....	T.N.T.C.	40,000	1,300	0
	22,900,000	144,000	0	0
Cloves.....	1,400	0	0	0
	81,500	0	0	0
Mace.....	1,000	(?) 300	100	0
	26,500	0	0	0
Red pepper.....	7,500,000	11,000	100,000	200
	13,750,000	57,500	8,000	0
Whole bay leaves...	23,000	100	0	0
	96,000	90	0	0
Whole mustard.....	0	400	0	0
	2,000	100	0	0
Onion salt.....	50,000	500	12,000	0
	42,500	1,700	6,750	10
Celery salt.....	550,000	600	100	0
	1,800,000	0	200	0
Garlic salt...	1,300	300	100	0
	3,000	55	0	0

Top numbers represent analyses made immediately after treatment; bottom numbers represent analyses made after 20 months storage.
*T.N.T.C.—Too numerous to count in 1:1000 dilution, therefore probably more than 300,000 per gram.

[1] L. H. James, Reducing the Microbial Content of Spices, *Food Industries*, August, 1938.
[2] R. S. McBride, Automatic Equipment for Spice Fumigation, *Food Industries*, August, 1938.



New Container Upsets Precedent

Catchup and chili sauce put into convenient, attractive jars and sold together in multiple-unit package

TODAY'S greatly increased home consumption of bottled "soft drinks" is primarily due to sales through retail food outlets. The upsurge in consumption began with the introduction of the six-bottle fiberboard container fashioned with a luggage handle to provide an easily carried package. This carry-away container with six nickel bottles usually retails for a quarter, plus bottle deposit. Other food manufacturers are now adopting innovations of this type of multiple-unit container to increase sales and to stimulate better displays of their products.

P. J. Ritter Co., Bridgeton, N. J., has recently introduced two of its products, catchup and chili sauce, in redesigned bottles nested in a multi-unit fiberboard container designed to command better displays and also to increase unit sales. This assembly, "Buffet Bowl Kondiment Kit," introduces other innovations in packaging.

The package which has had decades of acceptance by manufacturers as a container for semi-fluid, slowly flowing catchup is a tall, none too handsome bottle with a small opening through which the content is removed by "chugging," or pounding, the upturned bottle on the heel. This very fact has kept catchup off many American family tables. Even when the content of the bottle, or part of it, is emptied into a more attractive, more accessible dish for the table, whatever remains after the meal cannot be returned to the catchup bottle.

The catchup remaining in the dish stales and loses appeal if not returned to a container and sealed.

These disadvantages of the old container, so long tolerantly accepted by housewives, have been overcome by the Ritter buffet bowl containers. These bowls, squat and globe-shaped with a large top opening, are accessible like a fish bowl. They may come to the table or rest on the buffet without giving offense. They are attractive in shape and appearance, and carry no label once the top is removed. All the label there is is on the cap. When the buffet bowl comes to the table the content is spooned out, a procedure more certain of a measured quantity being delivered and accurately placed than usually results from "chugging" the standard catchup bottle. If the contents of a buffet bowl should be removed to a dish more suitable for an occasion, any left in the dish after the meal may be returned to the wide-mouth bottle and capped for further use.

The fiberboard container which forms the carry-away package for the two buffet bowls is simple of construction and is efficient. It is stamped out of one piece of fiberboard, and the scoring is all in the same direction. Two circular holes provided in the center of the blank fit over the caps of the bowls. Scorings permit the blank to be folded down the sides, under the bottoms and up between the bowls. Cutouts on each end of the blank project through a slot in the top to form the carry-away's handle. Lifting the carry-away by the handle tightens up on the bottoms of the bowls, pressing them firmly up in place in the holes which surround the bowl necks. The bowls are thus held secure in carrier.

The new Ritter buffet bowl container kit is a departure from custom. It is unique. It should command retail displays, especially in self-service stores. It should stimulate the purchase impulse at the point of sale, and it should be less discriminated against at the table. Its progress will be followed with interest.

New Packages & Products

Food Offered as Baby Gift

H. J. HEINZ Co., Pittsburgh, has just placed on the market a unique "Baby Gift" assortment specially packaged to induce purchase-for-gifting. The gift assortment is packaged in a specially designed folding carton inclosed in a corrugated mailing carton. The package contains, in addition to an assortment of 12 Heinz strained baby foods, a baby server and a 60-page baby book containing instructions to mothers on the care and feeding of an infant. The baby server consists of two glass bowls which nest into a carrier, these to be used in preparing and warming the baby's food, in serving the child or as covered containers for storage of baby food in the refrigerator. The Heinz gift assortment will be offered as a baby gift for all occasions, blessed events, showers, birthdays, Christmas —any time.

Retail Package Opens Market

FILBERTS now being produced in Washington and Oregon in increasing quantities have in the past been marketed almost entirely in bulk. Now the North Pacific Nut Growers Co-operative, Dundee, Ore., is endeavoring to widen the market for filberts by offering them to the retail trade shelled, toasted, salted and packaged in a consumer package. "Ambernut" filbert kernels, in tin cans bearing a colorful lithographed label depicting the contents, already have national distribution in selected food stores, better class cigar stands and cocktail bars. Here is another example of the importance of packaging in consumer containers products normally sold in bulk.

Digest of A.M.S. Standards For Canned Fruits

CONTINUING the series of abstracts of A.M.S. standards for canned fruits, started in the October issue of FOOD INDUSTRIES (page 61), the following four fruits are covered: canned blackberries, canned red raspberries, canned red sour pitted cherries and canned sweet cherries. Persons desiring the complete text of these standards should write to Agricultural Marketing Service, U. S. Department of Agriculture, Washington, D. C.

CANNED BLACKBERRIES

(Tentative)

Canned blackberries are prepared from properly ripened, fresh fruit by proper washing and sorting; may be packed with or without the addition of water or sugar, in hermetically sealed containers and sufficiently processed by heat to assure preservation of the product.

U. S. GRADE A or U. S. FANCY canned blackberries are blackberries of similar varietal characteristics; are of uniform color not lighter than Plate 47, L-7*, are practically uniform in size, not to exceed 5 percent by count being less than 20/32 in. in diameter; are practically free from defects; are firm, tender and intact; possess a normal blackberry flavor, and score not less than 90 points when scored according to the scoring system.

U. S. GRADE B or U. S. CHOICE canned blackberries are blackberries of similar varietal characteristics; are of uniform color not lighter than Plate 47, L-5*; are reasonably uniform in size, with not more than 5 percent by count being less than 19/32 in. in diameter; are reasonably free from defects; are reasonably firm, tender and intact; possess a normal blackberry flavor, and score not less than 75 points.

U. S. GRADE C or U. S. STANDARD canned blackberries are blackberries of similar varietal characteristics; are of fairly uniform color not lighter than Plate 47, L-3*; may be small and somewhat lacking in uniformity of size; are fairly free from defects; are fairly well intact; possess a normal blackberry flavor, and score not less than 60 points.

U. S. GRADE D (Seconds) canned blackberries are blackberries that fail in some respect to meet the requirements of the foregoing grades, or when any one of the grading factors, with the exception of UNIFORMITY OF SIZE, falls in the lowest subdivision. Blackberries that fall in this classification may be markedly variable in color or size, but are not off-color. Pathological or mechanical defects may be prominent, but the product is practically free from extraneous material. The blackberries may be markedly variable in degree of ripeness, but possess a normal blackberry flavor. Blackberries of this grade are normally packed in light sirup.

U. S. GRADE E (Water or Pie Pack) canned blackberries are of the same character as U. S. GRADE D (Seconds), except packed in water.

OFF-GRADE (Substandard) Canned blackberries are blackberries which fail to meet the requirements of the foregoing grades.

Blackberries are often packed in water in No. 10 cans in such a manner as to result in a drained weight in excess of 80 oz. Therefore, if the blackberries are so packed and meet all the requirements for either U. S. GRADE A, U. S. GRADE B or U. S. GRADE C, the canned blackberries will be certified as of the grade to which they conform, with the additional statement: "Heavy Pack."

Grades A, B, C, D, of canned blackberries are usually packed in sugar sirup. *At time of packing,* sirup of 40 deg. Brix density is used on U. S. GRADE A canned blackberries; 30 deg. Brix on U. S. GRADE B canned blackberries; 20 deg. Brix on U. S. GRADE C canned blackberries; and 10 deg. Brix on U. S. GRADE D.

Canned blackberries will be certified as to grade without regard to sirup density, but in each instance official certificates of grade will bear a notation in connection with the grade statement indicating the density of sirup *found upon examination.*[1] For this purpose "extra heavy sirup" means that the sirup tests 24 deg. or over Brix. "Heavy sirup" means that the sirup tests 19 to 24 deg. Brix. "Medium sirup" means that the sirup tests 14 to 19 deg. Brix. "Light sirup" means that the sirup tests 11 to 14 deg. Brix. "Water Pack" means that the packing media tests less than 11 deg. Brix.

"Normal flavor" means that the product is free from objectionable or off-flavors of all kinds.

The maximum head space and the minimum drained weight allowable in the cans commonly used in packing canned blackberries are tabulated in the standards. Cans of blackberries meeting the drained-weight requirements that have not been packed as full as possible without impairment of quality will be certified "Below Standard in Fill."

The grade of canned blackberries may be ascertained by considering, in addition to the foregoing requirements, the following factors[2]: Color (25 points), uniformity of size (15 points), absence of defects (25 points) and character of fruit (35 points).

The factor "absence of defects" has reference to the character of the workmanship in the preparation of the product, the absence of leaves, stems, detached seed cells and other extraneous material and pathological or insect damage. To receive the highest rating for character of fruit, the fruit must be mature, firm, fleshy and intact; and must contain no hard cores.

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EFFECTIVE, May 15, 1940.

CANNED RED RASPBERRIES

(Tentative)

Canned red raspberries are prepared from properly ripened fresh fruit by proper stemming, washing and sorting; may be packed with or without the addition of water or sugar; and are sufficiently processed by heat to assure preservation of the product in hermetically sealed containers.

U. S. GRADE A or U. S. FANCY canned red raspberries are red raspberries of similar varietal characteristics; are of uniformly good color, not lighter than Plate 5, J-5*, nor darker than Plate 6, K-6*; are practically uniform in size; are practically free from defects; are firm, tender and practically intact; possess a normal red raspberry flavor, and score not less than 90 points when scored according to the scoring system.

U. S. GRADE B or U. S. CHOICE canned red raspberries are red raspberries of similar varietal characteristics; are of good, reasonably uniform color, not lighter than Plate 5, G-5*, nor darker than Plate 7, C-6*; are reasonably uniform in size; are reasonably free from defects; are reasonably firm, tender and intact; posses a normal red raspberry flavor, and score not less than 75 points.

U. S. GRADE C or U. S. STANDARD canned red raspberries are red raspberries of similar varietal characteristics; may be somewhat lacking in uniformity of color, but are not lighter than Plate 4, J-4*, nor darker than Plate 7, H-6*; may be lacking in uniformity of size; are fairly free from defects; are fairly firm, tender, and intact; possess a normal red raspberry flavor, and score not less than 60 points.

U. S. GRADE D (Seconds) canned red raspberries may be pale or noticeably variable in color and size, but are not off-color; are fairly free from pathological defects and may possess prominent mechanical defects; may possess a noticeably variable texture; and possess a normal red raspberry flavor. Red raspberries shall be graded U. S. GRADE D (Seconds) when any one of the grading factors except UNIFORMITY OF SIZE falls in the lowest subdivision. Red raspberries of this grade are normally packed in light sirup.

U. S. GRADE E (Water or Pie Pack) canned red raspberries are of the same character as U. S. GRADE D (Seconds) except packed in water.

OFF-GRADE (Substandard) canned raspberries are red raspberries which fail to meet the requirements of the foregoing grades.

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* The colors mentioned are according to illustrations in the "Dictionary of Color", by Maerz and Paul.

[1] Sirup "cut-out" requirements, however, are not incorporated in grades of the finished product, since sirup as such is not a factor of grade for the purpose of these grades.

[2] The relative importance of each factor has been expressed numerically on a scale of 100. The essential variations within each factor are so described that the value may be ascertained for each factor and expressed numerically.

Grades A, B, C, D of canned rep raspberries are usually packed in sugar sirup. *At time of packing* sirup of 60 deg. Brix density is commonly used on U. S. GRADE A canned red raspberries; 40 deg. Brix on U. S. GRADE B canned red raspberries; 20 deg. Brix on U. S. GRADE C canned red raspberries; and 10 deg. Brix on U. S. GRADE D.

Canned red raspberries will be certified as to grade without regard to sirup density, but in each instance the official certificate of grade will bear a notation in connection with the grade statement indicating the density of sirup *found upon examination.*[1] For this purpose "extra heavy sirup" means that the sirup tests 28 deg. or over Brix. "Heavy sirup" means that the sirup tests 22 to 28 deg. Brix. "Medium sirup" means that the sirup tests 14 to 22 deg. Brix. "Light sirup" means that the sirup tests 11 to 14 deg. Brix. "Water Pack" means that the packing media tests less than 11 deg. Brix.

NOTE:—It is suggested that buyers using these grades as the basis of purchase should indicate the desired density of sirup in their contracts.

The maximum head space and minimum drained weight allowable in the cans commonly used in packing canned red raspberries are tabulated in the standards. Cans of red raspberries meeting the drained-weight requirements that have not been packed as full as possible without impairment of quality will be certified "Below Standard in Fill."

In determining compliance with the drained-weight requirements, tolerances shall be allowed for red raspberries packed in heavy sirups. In addition, if the average drained weight of cans of a sample complies with these requirements, the sample will be certified without exception.

The grade of canned red raspberries may be ascertained by considering, in addition to the foregoing requirements, the following factors[2]: color (25 points), uniformity of size (20 points), absence of defects (20 points) and character of fruit (35 points).

To receive the highest rating for uniformity of size, the red raspberries must be of practically uniform size, and 90 percent by count of the berries must be ½ in. in diameter or larger. As used in these grades "practically uniform" means that the diameter of the largest berry in the can is not more than ¼ in. greater than the diameter of the smallest.

To receive the highest rating for character of fruit, the fruit must be mature, firm, fleshy and practically intact, with not more than 5 percent by count of broken or mashed berries. The product and liquor must be practically free from detached seed cells. A "broken or mashed" berry is one that has been damaged to the extent that the original conformation of the berry is destroyed. Cognizance is taken of the fact that ripe red raspberries are soft when canned, and a berry that is merely flattened shall not be considered a broken or mashed berry.

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CANNED RED SOUR PITTED CHERRIES

(Final)

The Standards of identity, fill of container, and quality for canned red sour pitted cherries promulgated by the Secretary of Agriculture under Sec. 401 of the Food, Drug and Cosmetic Act of June 25, 1938, are hereby adopted for the purpose of these grades.

U. S. GRADE A or U. S. FANCY canned red sour pitted cherries are cherries of similar varietal characteristics; are uniformly red in color; are practically uniform in size; are practically free from defects; have a firm, fleshy texture; posses a normal red sour cherry flavor; and score not less than 85 points when scored according to the scoring system.

U. S. GRADE C or U. S. STANDARD canned red sour pitted cherries are cherries of similar varietal characteristis; are of fairly uniform, red color; are fairly free from defects; have a fairly firm, fleshy texture; possess a normal red sour cherry flavor; and score not less than 70 points.

OFF-GRADE canned red sour pitted cherries are cherries which fail to meet the requirements of the foregoing grades, or when any one of the grading factors except UNIFORMITY OF SIZE falls in the lowest subdivision.

Canned red sour pitted cherries that fall below the Standard of Quality promulgated under the Food, Drug and Cosmetic Act will be certified with the additional statement "Below Standard in Quality," together with the reason for so certifying.

Red sour pitted cherries are sometimes packed in sugar sirup. In each instance official certificates of grade will bear a notation in connection with the grade statement indicating the density of sirup *found upon examination.*[1] For this purpose "extra heavy sirup" means that the sirup tests 28 deg., or over, Brix. "Heavy sirup" means that the sirup tests 22 to 28 deg. Brix. "Medium sirup" means that the sirup tests 18 to 22 deg. Brix. "Light sirup" means that the sirup tests 14 to 18 deg. Brix. "Water Pack" means that the packing media tests less than 14 deg. Brix.

"Pitted" means that all pits have been removed from the fruit, with a tolerance provided, however, of not to exceed 1 pit in each 20 oz. of net contents.

The maximum head space and minimum drained weight allowable in the sizes commonly used in packing canned red sour pitted cherries are tabulated in the standards. Cans of red sour pitted cherries meeting the drained-weight requirements that have not been packed as full as possible without impairment of quality will be certified "Below Standard in Fill."

The grade of canned red sour pitted cherries may be ascertained by considering, in addition to the foregoing requirements, the following factors[2]: Color (25 points), uniformity of size (10 points), absence of defects (25 points) and character of fruit (40 points).

The factor "absence of defects" has reference to limb-rubs, scars, scabs, windwhips spray scald, stems, pathological defects, insect injuries and leaf tissues. The presence of mutilated or pitter-torn cherries is to be considered in this connection. Surface discolorations free from mold having a total area of a circle $\frac{3}{16}$ in. in diameter, or less, with no perceptible discoloration of the fruit tissue under the skin, will not be considered as defects.

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[2] "Sweet Cherries" include such dark colored varieties as Bing, Schmidt, Black Republican and Lambert. The light-colored varieties are commonly packed as "Royal Anne" Cherries.

CANNED SWEET CHERRIES[2]

(Final)

The standards of identity, fill of container, and quality for canned sweet cherries promulgated by the Secretary of Agriculture under Sec. 401 of the Food, Drug and Cosmetic Act of June 25, 1938, are hereby adopted for the purpose of these grades.

Canned sweet cherries may be pitted (stemmed cherries with pits removed) or unpitted (whole stemmed cherries).

U. S. GRADE A or U. S. FANCY canned sweet cherries are well-ripened cherries of similar varietal characteristics; are of high and practically uniform color for the variety; are practically uniform in size and symmetry; are practically free from defects; possess a firm but tender fleshy texture; a normal sweet cherry flavor; and score not less than 90 points when scored according to the scoring system.

U. S. GRADE B or U. S. CHOICE canned sweet cherries are well-ripened cherries of similar varietal characteristics; are of high and reasonably uniform color for the variety; are reasonably uniform in size and symmetry; are reasonably free from defects; possess a reasonably tender texture, a normal sweet cherry flavor; and score not less than 75 points.

U. S. GRADE C or U. S. STANDARD canned sweet cherries are cherries of similar varietal charactertistics. They many be fairly uniform in color, size and symmetry; are fairly free from defects; the texture may be variable, but none of the cherries may be objectionably hard, or, contrariwise, mushy; possess a normal sweet cherry flavor; and score not less than 60 points.

U. S. GRADE D (Seconds) canned sweet cherries are cherries which fail to meet the requirements of U. S. GRADE C in some respect, or which fall in the lowest subdivision in any one of the grading factors, and which possess a normal sweet cherry flavor and are not off color. Cherries of this grade are normally packed in light sirup.

U. S. GRADE E (Water or Pie) canned sweet cherries are of the same character as U. S. GRADE D (Seconds) except packed in water. If designated "Heavy Pack-Pie" the drained weight in No. 10 cans shall be not less than 86 oz.

OFF-GRADE canned sweet cherries are cherries which fail to meet the requirements of the foregoing grades.

Canned sweet cherries that fall below the standard of quality promulgated under the Food, Drug and Cosmetic Act will be certified with the additional statement "Below Standard in Quality," together with the reason for so certifying.

Grades A, B, C, D of canned sweet cherries are usually packed in sugar sirup. *At time of packing,* sirup of 40 deg. Brix density is used on U. S. GRADE A canned sweet cherries; 30 deg. Brix on U. S. GRADE B canned sweet cherries; 20 deg. Brix on U. S. GRADE C canned sweet cherries; and 10 deg. Brix on U. S. GRADE D.

Canned sweet cherries will be certified as to grade without regard to sirup density, but in each instance official certificates of grade will bear a notation in connection with the grade statement indicating the density of sirup *found upon examination.* For this purpose "Extra Heavy sirup" means that the

(*Turn to page 72*)

Hints and Hurdles

Constructive Versus Destructive Promotion

THOSE who attended the National Dairy Council's summer conference at Chicago this year heard Don Francisco, president of Lord & Thomas advertising agency, extol the advantages of cooperative national advertising. During this discussion, which proposed a national cooperative advertising campaign to increase the consumption of milk and dairy products, the successful results other food groups have attained through national cooperative campaigns were pointed out.

National cooperative advertising campaigns have produced gratifying results. They have increased sales and consumption of many foods. The market built for citrus fruits by cooperative national campaigns is one of the prime boasts of advertising.

The total consumption of both tea and coffee have been expanded through the aid of national campaigns. Pineapples, cranberries, Brazil nuts and walnuts owe a large measure of present sales volume to forceful national campaigns the costs of which have been distributed proportionally among the cooperating memberships.

These campaigns are constructive. They aid one food to compete against all foods for a better share of the national market. In contrast, state advertising campaigns promoting one or many state products are frequently destructive. State advertising campaigns generally infer, when they do not claim, the superiority of one state's products over another's. Injured states and those who fear slipping markets retaliate often with severe measures.

The national cooperative campaign is but an aggressive weapon in the battle for a share of the consumer goods market. State campaigns are inaugurated to advance the interests of the producers in one state at the expense of producers in other states. These campaigns engender retaliatory acts and retaliatory laws which erect more and more barriers to free interstate trade.

It's Time for Self Help On Public Relations

AMERICAN CAN CO. has recently released to the trade two booklets offering the services of public speaker Carlton F. Sturdy. The can company offers Mr. Sturdy's services in addressing two types of audiences, consumer groups and groups of wholesalers, retailers or business associations. Sturdy's 45-minute lectures to housewives and consumers, lectures "brimming with facts . . . which give a keener appreciation of how to buy and judge foods," promote no brands nor makes of containers. These lectures clear up misapprehensions and false ideas regarding canned foods. Sturdy's addresses to distributors stimulate retailer and clerk interest in all canned foods and provide retailers with answers to housewives' inquiries. This is a real public relations service to canners, one of several similar worthy services rendered to food processers by equipment manufacturers and suppliers of materials to the food industries. The need is great for just such efforts to improve the food manufacturer's relations with the consuming public. The food industries as beneficiaries should carry their share of this responsibility.

This can happen to YOU
THE TOWN THAT TOOK A DAY OFF
A remarkable story of how one man interested a community . . . and can interest you!

These booklets distributed by American Can Co. offer food manufacturers a public relations improvement service.

World War II Is Helping Domestic Wine Industry

WORLD WAR I cut this country off from its source of supply of dyes and chemicals, most of which came from abroad. This country was forced to develop a chemical industry which has since assumed world leadership. The importation of those few foods not produced within our domain was little interfered with during the first war. However, the present war has curtailed the importation of several important foods, among them the high quality European wines. It is not improbable that before peace is restored and normal commerce resumed native wine makers will have built a vintage wine industry in this country meriting domestic acceptance. Evidence of this development is the fact that at least one order has already been placed for native made-to-order wine. Though wine made to order is not unusual in Europe, this is probably the first order of its kind placed in the United States. Paul Masson Champagne Co. of Saratoga, Calif., is making from this year's grape crop 2,500 gal. of wine to specifications of order, for delivery in the fall of the year 1942.

Cuts Oven-to-table Time With FAST, LIGHT Trucks

House-to-house baker also has effective preventive-maintenance system

THE use of ½-ton panel delivery trucks carrying a payload of only 300 lb., instead of heavier capacity conventional step-in-drive vehicles, and the adoption of a four-step inspection system of preventive maintenance are features of the fleet installation of White Baking Co. This company has plants in Dayton, Ohio, and St. Louis, Mo.

The business of the White company is exclusively the house-to-house delivery of bread and allied bakery items. In contrast with other companies facing the same problems of distribution and employing larger capacity trucks, White has standardized on light, ½-ton panel delivery vehicles to make frequent and speedy deliveries and thereby reduce the interval between the oven and the table.

In its work the company has standardized on 1937, 1938, 1939 and 1940 Economy Model Chevrolets fitted with ½-ton or 1,000-lb. panel delivery bodies. It operates in all a fleet of 179 such vehicles, 67 working out of Dayton and 112 out of St. Louis.

Aside from its payload of bread and bakery goods, each vehicle is fitted with a series of drawers and shelves such as shown in one of the accompanying illustrations. Access to these shelves and drawers is had through the double rear doors of the panel delivery body.

With both rear doors open, the driver-salesman with his double-tray wire basket is able to quickly select a full assortment of items to anticipate his customer's requirements. The combined weight of the vehicle's payload and its interior fittings is well within its rated capacity of 1,000 lb.

With many or most of the company's routes extending out into the better-class suburban territories, the economy of the light-weight vehicle lies in its low first cost and low operating expense, together with its relatively high speed between stops and its ability to cover the route within the limits of the driver-salesman's work-day.

All of the trucks are painted and lettered in a uniform manner. The basic paint color is light yellow. The lettering is red, shaded with blue. The light basic color is in keeping with the trend to employ light rather than dark colors on vehicles handling food products.

All four fenders and the running boards of each vehicle are painted black for economy of maintenance in that black fenders can be repaired and touched up when dented at a minimum of expense as compared with fenders painted in any other color.

The light basic color of the body shows dirt readily and hence must be washed systematically to be kept clean and by that cleanliness suggest to the customer the cleanliness and purity of the bakery goods handled. All of White's trucks are washed at least once a week.

The maintenance force which keeps the fleet of 179 vehicles in service in the two cities designated consists of seven mechanics, four service men and five washers, a total of sixteen. This gives an average of slightly over eleven vehicles per man.

The fleet is depreciated upon a flat 20 percent per year for the sake of convenience, and the company endeavors to get 5 years' service from each truck. Some few units used on exceptionally long routes or under un-

Each of the 179 Chevrolet ½-ton panel delivery trucks used by White Baking Co. to deliver its products direct to customers from its plants in Dayton, Ohio, and St. Louis, Mo., is equipped with shelves and drawers as shown. These make it easy for the driver-salesman to stock his two-tray wire basket with enough items to anticipate his customer's needs.

The 67 ½-ton Chevrolet panel delivery trucks of White Baking Co. operated out of its Dayton, Ohio, bakery. Each truck is painted a light yellow. The lettering is red, shaded with blue. All fenders are painted black for economy of maintenance. Note also the metal frame on the left side to carry posters of items on special sales.

usually difficult conditions may be traded for new trucks when the cost of repairs to chassis or body reaches or exceeds the amount of depreciation charged for a given period.

Unit vehicle costs are maintained as a means of control. These costs are assembled by days and totaled into months and thereafter made accumulative by months and years over the life of the vehicles.

The White company is a firm believer in preventive maintenance as applied to its vehicles as a means to prevent trouble from developing while the units are out on their routes. To accomplish this end it has developed a four-step inspection system to determine the need for minor repairs and to forecast the necessity of major repairs.

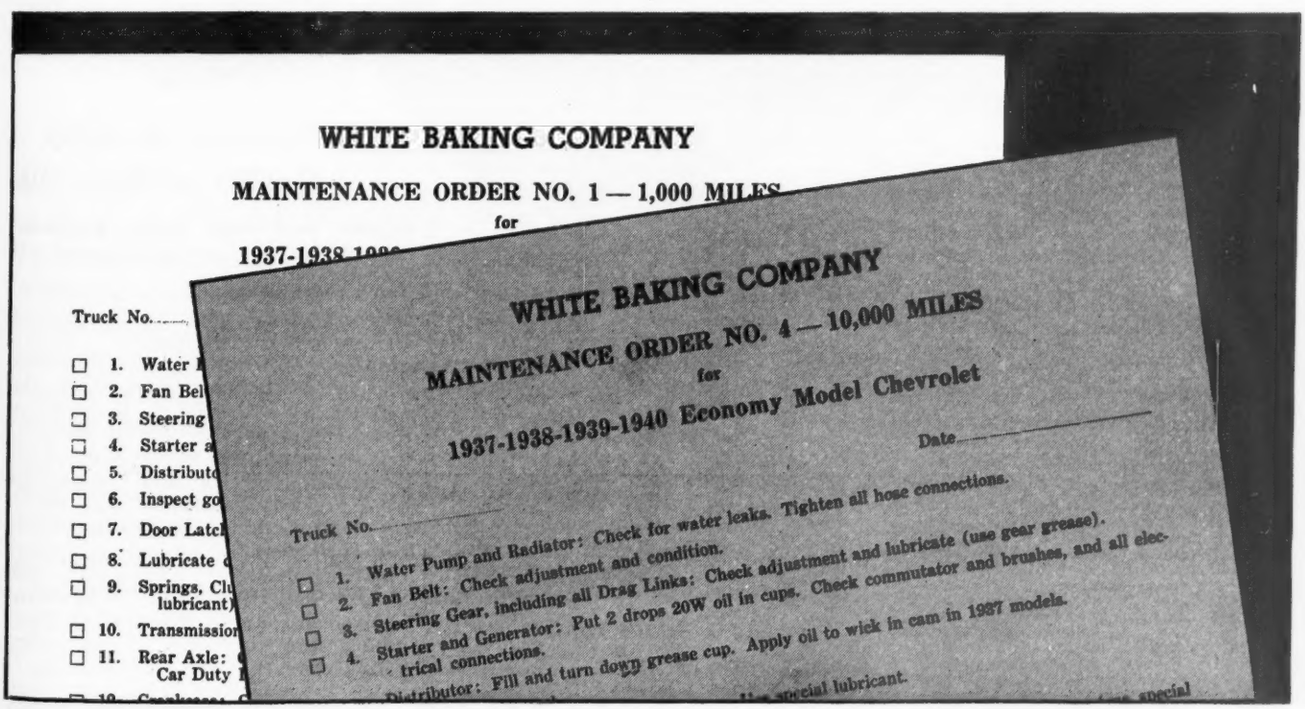
Portions of two of the inspection sheets used in the preventive maintenance system are shown in one of the illustrations on this page. The system in brief comprises four regular inspections to be made, respectively, at every 1,000, 2,000, 5,000 and 10,000 miles of operation.

So that nothing is left to chance and no item overlooked, the work to be done at each inspection is listed by number on a printed sheet. The sheet for each inspection is printed on a different colored paper—white for the 1,000-mile job, yellow for 2,000 miles, pink for 5,000 miles and blue for 10,000 miles.

On each sheet, the first 19 items are alike and include a lubrication of the vehicle and checks on the water system, starter and generator, distributor, brakes and so forth.

As the mileage increases, the number of items listed also increases, beginning at 19 at 1,000 miles and ending at 43 at 10,000 miles.

The speedometer reading is recorded at each inspection and each item must be checked off as the work is performed and the sheet signed by the mechanic making the inspection to fix the responsibility for work poorly or improperly done.



WHITE BAKING COMPANY

MAINTENANCE ORDER NO. 1 — 1,000 MILES

for

1937-1938-1939-1940 Economy Model Chevrolet

Truck No.

☐ 1. Water Pump and Radiator: Check for water leaks. Tighten all hose connections.
☐ 2. Fan Belt: Check adjustment and condition.
☐ 3. Steering Gear, including all Drag Links: Check adjustment and lubricate (use gear grease).
☐ 4. Starter and Generator: Put 2 drops 20W oil in cups. Check commutator and brushes, and all electrical connections.
☐ Distributor: Fill and turn down grease cup. Apply oil to wick in cam in 1937 models.

WHITE BAKING COMPANY

MAINTENANCE ORDER NO. 4 — 10,000 MILES

for

1937-1938-1939-1940 Economy Model Chevrolet

Truck No. Date

☐ 1. Water
☐ 2. Fan Bel
☐ 3. Steering
☐ 4. Starter a
☐ 5. Distributo
☐ 6. Inspect go
☐ 7. Door Latc
☐ 8. Lubricate
☐ 9. Springs, Cl lubricant)
☐ 10. Transmissio
☐ 11. Rear Axle: Car Duty

Portions of two of the four maintenance order forms which comprise the White company's preventive-maintenance system. Each order lists items to be attended to at 1,000, 2,000, 5,000 and 10,000 miles of operation. The blank square to the left of each numbered item on each sheet must be checked off as the work is done and the sheet signed by the mechanic.

The Food Industry News

GENERAL NEWS, BUSINESS TRENDS, MEN, JOBS AND COMPANIES • NOVEMBER, 1940

Defense Commission Surveys Food Resources of the Nation

Is making exhaustive inventory of all phases of industry to get data on which to base "if and when" emergency plans

THE FOOD SUPPLY SECTION of the National Defense Advisory Commission started during October what probably will be the most exhaustive inventory of the nation's food resources ever attempted, prelude to preparing "if and when" programs to meet all foreseeable contingencies.

The inventory will cover production, stocks on hands, facilities for warehousing, processing, manufacturing and distribution of all foodstuffs—from soup to nuts, from seed to dinner tables. A special interdepartmental conference committee, divided into 14 subgroupings and working under the direction of George Livingston of the Millers' National Federation, food supply chief in Chester Davis' agriculture division, has been set up to catalog the detailed information which is to be corralled from government agencies and from trade associations, individuals and groups in the industry.

The job is expected to take some little time. The first step has been to cull government bureaus and trade groups for the data they regularly compile. The next step will be to fill in the missing pieces needed for a complete picture through trade organizations and, where advisable, by direct contact with individuals and companies.

Those who wish to volunteer data they believe will be helpful, Mr. Livingston says, should get in touch either with him or with the chairman of the subdivision of the interdepartmental committee handling the phase of the job in which they are interested. These subchairmen are:

Mr. Livingston, planning and procedure; W. F. Callander, Agricultural Marketing Service, cereals and cereal products; C. L. Harlan, Agricultural Marketing Service, livestock and meats; Edmond E. Vial, Bureau of Agricultural Economics, dairy and poultry products; R. H. Fiedler, Fish and Wildlife Service, Interior Department, fish; Charles E. Lund, Bureau of Foreign & Domestic Commerce, Commerce Department, fats and oils; Reginald Royston, Agricultural Marketing Service, fruits, vegetables and nuts; C. E. Birgfeld, Bureau of Foreign and Domestic Commerce, canned, dehydrated and frozen foods; Warren C. Funk, U. S. Tariff Commission, sugar, molasses, sirups and honey; Mary L. Bynum, Bureau of Foreign and Domestic Commerce, tropical food products (coffee, cocoa, tea, spices, bananas, etc.); George C. Edler, Agricultural Marketing Service, seeds; Charles E. Gage, Agricultural Marketing, tobacco; J. R. Fleming, Bureau of Agricultural Economics, food requirements; Mr. Livingston (temporary chairman), distribution facilities.

As soon as complete data is collected on supplies, both current and potential, Mr. Livingston expects to set up against these statistics estimated requirements for civilian population, for the armed forces, for export and for possible foreign relief. The last listed is, of course, simply a big question mark at this time, but so long as the possibility exists that America will be called upon to feed a starving Europe, either during or after the war, Mr. Livingston plans to include the best possible figures for such a demand in his statistical setup.

With these tables of products available and products required before them, the Food Supply Section plans next to turn its attention to preparing paper plans for administering the nation's food supply under given possible conditions. Mr. Livingston assured the FOOD INDUSTRIES Washington correspondent, and he has reiterated the assurance in several talks at trade association conventions, that all such paper plans will be set up on a strict "when, as and if" basis—"for use if, and only if, they are needed."

In general, Mr. Livingston is convinced that it is quite improbable to expect a situation to arise which would require the extensive organization and regulation that was needed in 1917. He believes that the AAA program is sufficient to handle any production problems and that with ample supplies of foodstuffs available, present distributing agencies should be able to function normally, with the assistance only of whatever supervision may be required to keep a check on speculation, on unjustified price spirals and on other such abuses.

A third, and long-range, phase of Mr. Livingston's program deserves comment. It is the job of preparing a food defense against economic aggression in the inevitable period of turbulent readjustment following the war. At this stage, that part of the program is getting secondary attention, of course, but it envisions taxing to the utmost the nation's intelligence and ingenuity to prepare to deal in international trade on whatever basis is required under the conditions which exist during the future.

HEADS DAIRY GROUP

Professor Harry W. Cave has been elected president of American Dairy Science Association for the coming year. He is with Oklahoma A & M College, Stillwater. The new vice-president is Henry F. Judkins, Sealtest, Inc., New York.

Light Damages Keeping Quality of Fats, Oils

Butter and lard more resistant than corn or cottonseed oil

THE ACTION of light, either daylight or artificial, on fats and oils is known to affect their keeping quality. Experiments by G. R. Greenbank at the Bureau of Dairy Industry, U.S. Department of Agriculture, have shown that light in the blue end of the spectrum, around 4000 Angstrom units, has the strongest effect, as would be expected from previous experience with photochemical reactions. Animal fats, butter and lard, were found to have greater resistance to light deterioration than corn oil or cottonseed oil. The extent of the reaction was measured by determining the formation of peroxides. This phenomenon has practical significance in connection with those food products which contain significant amounts of fats or oils and which are exposed to light when on display in retail markets.

Only *Nash Vacuum Pumps* have all of these advantages

Nash Vacuum Pumps are simple, having but one moving part. These pumps have unusual characteristics. They will handle a gas and a liquid simultaneously. Slugs of liquid entering a Nash Vacuum Pump do no harm. Thousands are rendering service where this condition is present.

A unique feature of Nash Vacuum Pumps is that, in handling hot and saturated vapors, they have a condensing effect . . . The operating principle involves an internal liquid seal, which condenses and contracts hot vapors and gases . . . Unless the amount of hot vapor is great, other condensing devices are not necessary.

This liquid seal may be varied with the gas being pumped. On solvent work the percentage of recovery may be increased by using a suitable liquid as the pump seal and recirculating this liquid. Because of the complete lack of internal lubrication, the solvent cannot become contaminated.

Nash Vacuum Pumps are furnished in a wide range of capacities up to 5,000 cubic feet per minute. In single stage design they efficiently maintain vacuums up to 27 inches of mercury, and in two stage design vacuums above 29 inches.

THE NASH ENGINEERING COMPANY

226-A WILSON ROAD • SOUTH NORWALK, CONNECTICUT • U. S. A.

Effect of National Defense On Foods Discussed by Bakers

Problem now is surplus, not shortage. Army to bake but will buy sweet goods and C ration. Vitamins in bread argued

ATTENTION was focused on defense at the convention of American Bakers Association, held in Chicago, October 13–16.

Clarence Francis, president of General Foods Corp., reminded those present of the difference in raw material and ingredient supplies now and during the World War. Our outstanding problem now is surpluses, except in a very few instances. During the last war there was such a shortage of wheat, sugar, fats and other commodities that substitutes had to be resorted to with marked changes in formulas, production methods and merchandising. As a result, prices soared, quality suffered and merchandising practices followed lines of least resistance.

L. J. Schumaker, president of American Bakers Association, put the baking industry on record as being prepared to meet present-day demands. And he said that in research work and the study of nutritional problems it is preparing to meet increased future demands. He cited problems arising out of merchandising competition as being the industry's major problem and made a plea for increased efforts to solve those problems.

George Livingston, chief of the food supply section of the agricultural division of the National Defense Advisory Commission, assured the bakers that a program was being worked out with agriculture to assure a continued ample supply of needed foodstuffs during a war period and to avoid an economically destructive post-war adjustment regardless of who wins the present European and Asiatic wars.

To meet demands of present-day army mobilization needs for bakery products at the rate of ½ lb. per man per day, baking facilities will be maintained by the Quartermaster Corps at the mobilization or training center where more than 500 men are stationed. Baked sweet goods will not be on Army rations in regular mess halls. However, they may be purchased from wholesale bakers for officers' mess, canteen supplies and special mess occasions by direct contract, not on a bid basis. During the early days of mobilization and cantonment building, before Army bakeries can be set up, bread will be bought from wholesale bakers on a monthly indefinite-purchase contract basis.

Type C field rations, consisting of crackers, soluble coffee and sugar packaged in an airtight sealed can, are to be purchased by the army on a competitive bid basis open to bakers as well as others who can meet army specifications.

The role of vitamins and other nutritional agents in bakery products was handled during two sessions by the "Information Please" method of discussion. The first session was given over to experts favoring nutritional adjuncts. They took the position that vitamins, wheat germ and basal metabolism minerals ought to be in bakery products on a restored natural-content basis, at least. They also held that the cost of incorporating these nutrition values in bakery goods should be absorbed by the producer of the foods at no increased cost of products to the consumer.

The second session was given over to the practical-minded technical and production spokesmen of the baking industry. They held that bread should be made and marketed on the basis of its quality as a loaf of bread, an every-meal item of the human dietary. And that its market price should be in terms of its ingredient and production cost. They further contended that, first and foremost, the bread should be good bread, not merely a carrier of medicants and added nutritional agents, regardless of whether they are contained at a restoration or fortification level.

Two Food Standards Taken Into Courts

Industry brings suits to change label requirements for dried milk and for condensed milk

COURT REVIEWS of the standards of identity for dried skim milk and sweetened condensed milk are pending. The standard of identity for canned fruit was subject to court appeal last spring, but that action is in suspense because of the reopening of the canned fruit standard by FSA for the hearings held during September. All of these cases represent more or less friendly suits to determine technicalities which cannot be settled finally without court action.

Milk cooperatives of the Twin Cities area have instituted the dried skim milk case in the hope that their old label designation may be continued, contrary to the standard that was to have taken effect on October 10. The officials of FSA have agreed to postpone the effective date by three months so that this case may be litigated without the necessity of immediate label change by certain companies. The government officials felt that it was unfair to compel immediate label changes with the chance that the companies might be allowed by the court to return to their old labels within a few months. Of course, the FSA attorneys are contesting the case by vigorous defense of the standard which requires the label name, "dried skim milk."

The appeal from the sweetened condensed milk standard was taken first by A. E. Staley Manufacturing Co. in the Chicago circuit court. The effort of this appellant was to secure the privilege within a standard of using unlimited quantities of corn sirup as a sweetener without label declaration. A motion to dismiss by FSA on the ground that the supplier of an ingredient is not entitled to direct appeal in the court, may make necessary such review of the standards in the name of some firm actually making the sweetened condensed milk. A concern of that sort would, of course, have standing in court though the suppliers may not, if the circuit court justices wish to restrict sharply those who may originate litigation of this character.

Plans for Tin Smelter Hinge on Japan's Action

Decision put up to committee. Tin supplies sufficient for year

THE LONG-RANGE viewpoint of tin supplies for this country has entered current negotiations for a tin smelter. The question being posed is: Should any U. S. smelter be set up for the duration of the emergency or should it be assured tin ore supplies after peace comes and be built as a permanent new industry for this country?

The problem of making a decision has been tossed into the lap of a special committee headed by Clyde Williams, director of the Battelle Memorial Institute of Columbus, Ohio. This committee's ultimate recommendation will hinge largely upon developments in the Far East. Tin supplies presently are coming into the country at a satisfactory rate, both for industrial use and for the stockpile. The defense commission estimates that present supplies are sufficient for a full year of normal use—more than that with some rationing. Thus, if the Far Eastern situation just simmers, there is no pressing hurry for a decision on a smelter. On the other hand, if the Japanese crisis explodes into something serious, prompt action would then become imperative.

Tending to push a decision, however, was the successful negotiation late in October by Reconstruction Finance Corp. for an annual quantity for five years, of Bolivian ore equivalent to 18,000 tons of tin—perhaps one-fourth a normal year's demand. Of this amount, however, up to 6,000 tons of ore a year will be sold to the British if they want it, and RFC will consider requests for more than that if needed.

Industry Objects To Dietary Labels

Voices opposition at hearing on label statements proposed by Food, Drug Administration

THE HEARING to establish proper label statements on dietary foods, opened on October 7, was divided into three parts. The first part was a four-day presentation by the government of its proposed labeling requirements. This was in the form of testimony and factual support of the proposals printed in the *Federal Register* for September 5, 1940.

The second part of the hearing was a two-day session beginning October 14. At this time manufacturers' objections and suggestions were made. Among the objectors were representatives of the dairy industries and the breakfast food manufacturers who do not like to have their products called "dietary foods" just because they make claims for the contained vitamins and minerals.

The third part of the hearing was scheduled for October 28, to deal especially with dairy products. This date was chosen at the request of the dairy groups whose convention in Atlantic City, beginning October 21, would otherwise have conflicted with the hearing. The irradiation and the addition of vitamin concentrates to milk were brought out early in the discussion.

The question of label declaration of natural vitamins and minerals in milk and other common foods, as distinct from "dietary foods," continues to be a subject of concern. Declaration of added vitamins and minerals is admitted by most manufacturers to be desirable practice. But objection is raised to imposing dietary food regulations on manufacturers who wish to do more than reveal the presence of natural vitamins and minerals in their products.

SCHEDULE OF EVENTS

NOVEMBER

11–15—American Bottlers of Carbonated Beverages, convention and exposition, Music Hall, Cincinnati.
17–20—New England Bakers Association, fall convention, Hotel Statler, Boston.
25–27—Associated Grocery Manufacturers of America, annual meeting, Waldorf-Astoria Hotel, New York, N. Y.

DECEMBER

2– 7—14th National Exposition of Power and Mechanical Engineering, Grand Central Palace, New York.
11–15—National Chemical Exposition, Stevens Hotel, Exposition Hall, Chicago.
12–13—Northwest Frozen Foods Association, New Washington Hotel, Seattle.
27–29—Society of American Bacteriologists, Hotel Jefferson, St. Louis, Mo.

Japan Causes U.S. To Drop Subsidies

Over half of subsidized exports of wheat and flour to China went to Japanese-held ports

THE Department of Agriculture's sudden cancellation of the wheat and flour export subsidy program from Pacific ports to Hong Kong and China in mid-October was solely a maneuver to get out of an embarrassing situation and strengthen the State Department's stand in the Far East.

Of 10 million bushels of wheat and flour—mostly flour—shipped under the subsidy program from January to October, more than one-half went to North China ports in Japanese hands. With the subsidy $1 per barrel on flour and between 20 and 25 cents a bushel on wheat, this means one U. S. department was spending huge sums to boost shipments of vital foodstuffs to territory held by a nation with which another U. S. Department is having troubles.

Officials felt that American business might not suffer materially by the action. The only alternative sources of supply for these ports are Australia and Canada, and Britain's relations with the Japanese are even less friendly than this country's.

NEW WRAP KEEPS CRUNCH IN CELERY

Celery is said to keep fresh several days longer on the counter and to have more sales appeal when packaged in the new container now being used in the Chicago area by Growers Distributing Co. And at refrigerator temperatures of 35 to 40 deg. F. the extra life runs into weeks. Called "Pliofilm-Pak," the container is in the form of an envelope. This is slipped over a cone-shaped flexible wire framework and the celery inserted through the opening, a rubber band completing the package (left, above). The cost is placed at 2½ to 3 cents more per package than untrimmed "standard" celery, including cost of package, additional handling, trimming and the extra value of the select celery. This difference has easily been obtained in a quality market, and savings in waste usually more than make up for the additional initial cost, it is reported. Among important retailers using the container are Great Atlantic and Pacific Tea Co., Jewel Food Stores, "Stop and Shop," and Hillman's Food Stores. Atlantic Commission Co. is introducing it in Detroit, and Cleveland Celery Market Co. in Cleveland. The new package for keeping celery fresh is made by Neostyle Inc., Chicago.

Americas To Pool Advances In Dairy Industry Technology

Pan American committee formed at convention to make recent developments available to Western Hemisphere countries

CLIMAXING dairy industry week at Atlantic City, October 21 to 26, a Pan-America Conference Committee for the Dairy Industries was formed during a luncheon meeting attended by over 400 delegates, including prominent Latin American diplomatic representatives. In announcing the formation of the committee, H. L. Miller, president, Dairy Industries Supply Association, said: "In dairy science and technology the United States has had an acknowledged leadership. We, in this country, hope to make available to the governments and the peoples of the American nations all the advances in dairy industrial technology of recent years and to adapt these discoveries, these processes and these inventions to all conditions in the various nations of the hemisphere."

As the principal speaker at the meeting, R. H. Geist, chief, Division of Commercial Affairs, U.S. Department of State, pointed out that it was the policy of the United States Government to foster and promote good relations between the nations of this hemisphere. He named the governmental departments and agencies charged with this function and indicated that these stood ready to aid the new committee, stating that if the long-range program of making all the nations on this side of the Atlantic economically sound and stable is to succeed, there will be required as well the unstinted cooperation of all the financial, industrial and commercial interests of all the countries in the Americas. Mr. Geist also made a plea for American manufacturers to eliminate once and for all the employ of unreliable, non-American sales agents in Latin America.

Other speakers at the meeting included Dr. Hugh S. Cumming, director, Pan American Sanitary Bureau; Dr. Luis Fernandez, Minister of Costa Rica; and A. B. Fragoso, secretary of the Brazilian Embassy.

The committee as formed includes H. L. Miller, DISA, chairman; R. H. Geist, U.S. Department of State; E. N. Bressman, U.S. Department of Agriculture; F. H. Rawls, U.S. Department of Commerce; C. H. West, Canada; C. Del Campo, Chile; M. E. Quirne-Lavalle, Argentina; A. B. Fragoso, Brazil; F. A. Gallegos, El Salvador.

In addition to the formation of this committee, Dairy Industries Week included the annual meetings of the International Association of Ice Cream Manufacturers; the International Association of Milk Dealers; and the National Association of Retail Ice Cream Manufacturers. More than 20,000 members and guests were registered at these three conventions and at the exposition of the Dairy Industries Supply Association at which 302 exhibitors filled the great Atlantic City Convention Hall with the largest single industry exhibit of machinery and supplies ever held in the United States.

Brewers To Study Action of Protein

Plan research on its relation to fermentation. New developments shown at exposition

ADOPTION of an expanded research program highlighted the 37th annual convention of Master Brewers Association of America, held in St. Louis, Oct. 20–24. The new research project is to study proteins in relation to fermentation processes and brewing practice. It is to be renewable annually for at least the next two years and is to be on a fellowship basis at Stanford University under the direction of the colloid chemist, Dr. C. W. McBain. Dr. Olaf Stamberg, biological chemist, is to carry on the studies.

In addition, a six-month fellowship study in fermentation at Siebel Institute of Technology was awarded to Fred Hahn of Griesedieck Bros. Brewery Co., St. Louis.

To assure a continuation of policy and program, the 1940 officers hold over for another year. They are: George B. Sippel, Burger Brewing Co., Cincinnati, Ohio, president; Philip Berkes, Scheik Brewing Co., Norristown, Pa., 1st vice-president; Louis J. Walther, Griesedieck Bros. Brewing Co., St. Louis, 2nd vice-president; Henry R. Henius, Wahl-Henius Institute, Chicago, 3rd vice-president; Henry O. Sturn, Standard Brewing Co., Rochester, N. Y., executive secretary; and Edward Geisler, Blatz Brewing Co., Milwaukee, treasurer.

A record-breaking total attendance of more than 3500 was attracted by the largest brewing materials and equipment exposition ever held in the history of the brewing industry. More than 200 exhibitors filled the 100,000 sq.ft. exhibit hall with more than $500,000 worth of equipment, materials and supplies.

A number of new developments made since the Milwaukee exposition in 1937 were exhibited. Among these were wooden barrels made from uniform standard-sized laminated staves with white oak inner layer and white oak or hard maple outer layer; recording control instruments which give direct pH reading for wort; can fillers and sealers operating at a rate of 400 to 500 per minute; horizontal, zoned temperature pasteurizers operating at 400 12-oz. containers per minute; twin labelers operating at 135 12-oz. bottles per minute, electrical precipitators for freeing air from dust, smoke or fumes; and sanitary fittings made from plastic materials.

Master Brewers Association will hold its October, 1941, meeting at Baltimore, Md.

AMERICA'S BIGGEST ONE-INDUSTRY EXHIBIT

Both the main floor, shown here, and the lower floor of the Atlantic City Convention Hall were crowded by 302 exhibitors and more than 20,000 visitors during the week of October 21, when the Dairy Industries Supply Association held the largest single industry exhibit of machinery and supplies ever held in America.

War Robs Packers Of Export Market

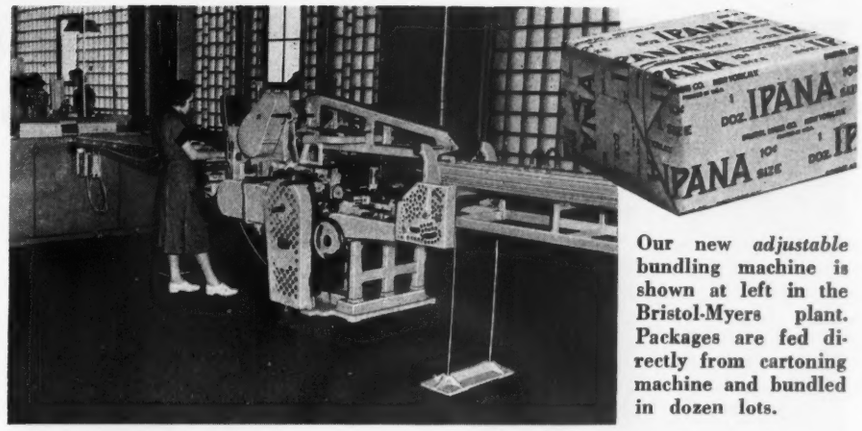
Industry counters with campaign promoting recently discovered vitamin values in meats

OUTSTANDING DEVELOPMENTS in the meat packing industry during the past year were summarized by George A. Schmidt at the annual convention of Institute of American Meat Packers in Chicago, October 18–22. Mr. Schmidt, who is chairman of the Institute and president of Stahl-Meyer, Inc., New York, mentioned these important points:

GEORGE A. SCHMIDT
Reelected chairman by meat packers

(1) With export markets virtually wiped out as a result of the war, the American meat industry is operating on practically a domestic basis, and about all of the meat produced in this country is being consumed here. (2) The meat packing industry has developed and put into action a national advertising and sales program campaign emphasizing the merits of meat, with advertising being carried in the leading magazines and newspapers throughout the country. (3) Scientific experiments completed during the past year show that meat is an outstanding source of the vitamin B group; that recent findings show that one pork chop contains enough thiamine (vitamin B_1) to meet the average normal requirements of a person for one day.

George A. Eastwood, president of Armour & Co., Chicago, emphasized the need for low meat prices. He said that there was a lot of talk about what $\frac{1}{8}$ or $\frac{1}{4}$ cent a pound more in price would mean to the meat industry. But, he continued: "We hear far too little about what $\frac{1}{8}$ or $\frac{1}{4}$ cent less a pound in manufacturing cost or supervising cost or distributing cost would mean. If the managers of an industry as complex and as pregnant with possibilities as ours cannot figure ways and means to get this $\frac{1}{8}$ or $\frac{1}{4}$ cent between the buying



Our new *adjustable* bundling machine is shown at left in the Bristol-Myers plant. Packages are fed directly from cartoning machine and bundled in dozen lots.

NOW—An ADJUSTABLE Bundling Machine

New Opportunities for Large Savings

Now manufacturers may bundle several different sizes of packages on a *single* machine . . . The introduction of this new, *adjustable* bundler is an important step ahead—it means that many more concerns can now take advantage of the large savings which machine bundling makes.

Replacing costly made-to-order boxes, the bundling machine wraps the packages in a strong kraft paper which carries safely. Many manufacturers have saved as much as 60% on material costs. Moreover, shipping costs are greatly reduced as the paper weighs one-third as much as cardboard containers. Machine bundling also saves the floor space formerly required for storing and packing stocks of bulky boxes.

Our new adjustable machine requires only one operator to do the work of many hand packers. Wraps packages in lots of varying numbers depending on their size. Packages may be assembled in various ways to suit the shape of the bundle desired. Plain or printed wrappers may be used.

If you operate cartoning or wrapping machines, this new bundler is your next logical step towards greater plant efficiency.

Write for complete information

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Springfield, Mass.

NEW YORK CHICAGO CLEVELAND
LOS ANGELES TORONTO

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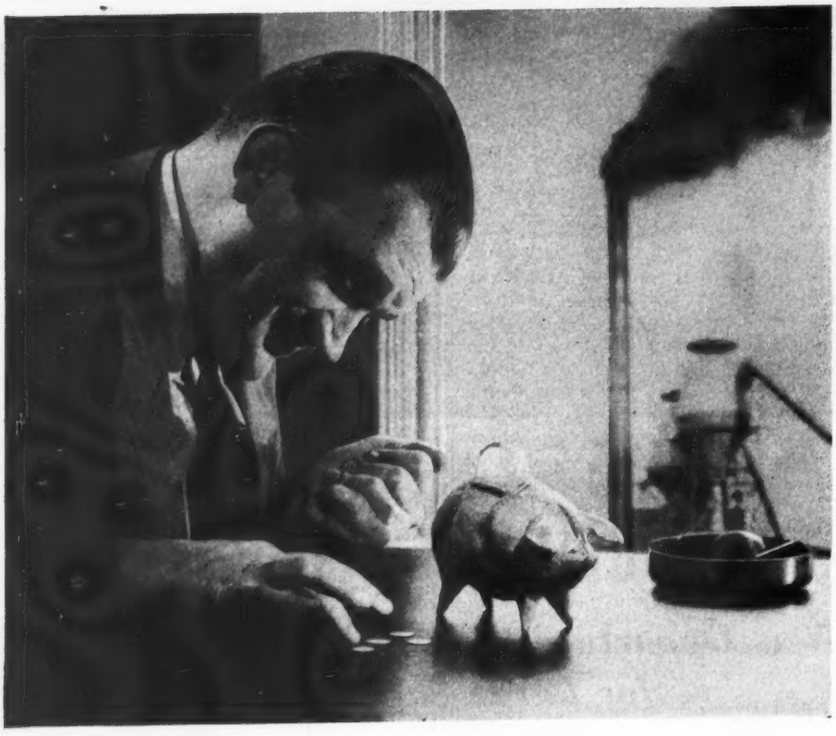
Buenos Aires, Argentina: David H. Orton, Maipu 231
Peterborough, England: Baker Perkins, Ltd.
Melbourne, Australia: Baker Perkins, Pty., Ltd.

PACKAGE MACHINERY COMPANY
Over a Quarter Billion Packages per day are wrapped on our Machines



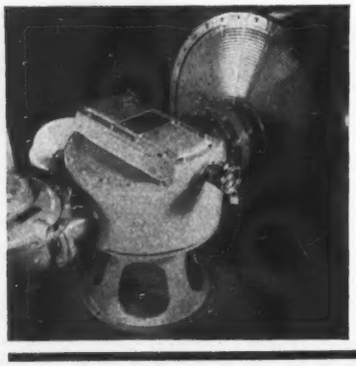
"Save The Pennies"...

says an old maxim, "and the dollars will look after themselves."

That's just the trouble . . . they *will.* And it's a reasonably safe bet that right now (if you have roasting, toasting, high-temperature cooking or can-making operations) that dollars, *not pennies,* are winging their way out of your stacks.

We say that because we are saving other food firms from 15 to 50 percent in fuel. If, in your case, we are wrong, we'll apologize. If we're right, you'll have a better story for the next annual meeting.

Why not ask us how much we can save for you. People you know have done it—and they are mighty glad they did. Write **The C. M. Kemp Mfg. Co., 405 E. Oliver St., Baltimore, Md.**



Complete premixing of gas and air by the patented, exclusive, Kemp Industrial Carburetor provides complete combustion, uniform flame characteristics and pressure, the ultimate in economy and control.

KEMP of BALTIMORE

level and the selling level, why should we expect our salesmen to add it to the price they work out of the customer."

In commenting on the outlook for the packing industry, Mr. Eastwood said that the real value of the industry's advertising campaign will not lie in raising livestock and meat prices but in broadening the market so that volume can be increased.

Harry J. Williams, vice-president of Wilson & Co., Chicago, told the packers that lard production this year has been at normal levels for the first time since 1933. But exports to all countries have declined from 848,000,000 lb. in 1929 to only 200,000,000 lb. at present. This increase in production and loss of markets have resulted in an unusually low level of lard prices.

At the closing sessions of the convention, the packers changed the name of their organization to "American Meat Institute", which is simpler and more representative of the organization.

George A. Schmidt was reelected chairman of the Institute, Wesley Hardenbergh was reelected president and six vice-chairmen were reelected.

Employees Sue Packers For Overtime Wages

FOUR big Chicago packers are being sued for an estimated $2,500,000 in overtime wages allegedly due 78,000 of their employees throughout the country, plus penalties in a like amount. Defendants are Armour & Co., Swift & Co., Wilson & Co. and Swift's subsidiary, G. H. Hammond Co. The wage and hour suits were filed during October in the Chicago federal court by Arthur J. Goldberg, counsel for the Packinghouse Workers Organizing Committee, a C.I.O. affiliate, for 83 individuals and were brought as class suits to include other employees.

Surplus Wheat and Rice Go to War-Torn China

CHINA has become the second war-torn country to receive war relief food supplies purchased with American government money and distributed through the Red Cross. Shipment of 500 tons of cracked wheat and rice, bought through the Department of Agriculture, was started for Shanghai in October in the wake of previous food shipments to Finland.

The Chinese relief is being started on a "trial balloon" scale, to see whether foodstuffs actually can be distributed in Japanese-held China to Chinese war victims. If it can, the program will be greatly expanded.

Food shipment to China represents the only new development in the American government-financed war relief program during October. With Continental Europe blocked off, the only other likely spot for American relief is England, and so far the British have not sought relief aid.

What Makes Foods Go Rancid Told by Edible-oil Experts

Bad effects of metals and light and beneficial action of antioxidants discussed. Cereals present a special problem

INTENSITY of interest in chemical changes common to fats and oils was shown by a record attendance of 300 at the 14th fall meeting of American Oil Chemists' Society in Chicago, October 2–4. The high point of this meeting was a lengthy symposium on oxidation, rancidity and flavor reversion of fats and oils. At this symposium, H. A. Mattill, State University of Iowa, evaluated all observed evidence of the mechanism of the oxidation of fats as merely straws in the wind. He stated that: "No all-inclusive theory of auto-oxidation can yet be formulated. Once the beginning or induction period is past, events follow thick and fast in greatest confusion but nevertheless according to a plan. The plan is flexible and in part dictated by the events or steps themselves. Perhaps the primary reaction in the oxidation of fat yet remains to be discovered."

Mayne R. Coe, Food Research Division, U.S. Department of Agriculture, identified metals and light as primary factors known to increase the rate of oxidation of fats and oils. Air, moisture, temperature and photo-sensitizers were tagged as contributing factors.

Conclusions drawn by Mr. Coe are that: (1) Oils and fats are kept free from rancidity longest by excluding, as far as possible, objectionable metals; copper particularly; (2) when the intensity of light to which oil-bearing foods are exposed is the same, the ultraviolet, violet and blue regions of the spectrum (wave lengths below 4900 Angstrom units) promote rancidity the most actively, while light having wave lengths in the region of 5400 to 7400 promote rancidity the least. Light with wave lengths in the region of 5700 (yellow) and that in the region of 6600 (red) are less active than that in the blue region but more reactive than that in the green region of the spectrum; and (3) light from those regions of the spectrum reactive in catalyzing rancidity appears to correspond with the light-absorption regions of the oils.

H. S. Olcott, Mellon Institute of Industrial Research, described the mechanism of fat oxidation as a chain reaction because such small amounts of certain antioxidants can retard the oxidation for long periods of time. Good sources of vitamin E and ascobic acid (vitamin C), as well as polyphenols, pyragallol, hydro-quinone, catechol, apional and hydroxy-hydroquinone were listed as antioxidants for lard. Less effective ones are meta-substituted polyphenols.

Action of the antioxidants is explained as preventing the combination of reactive fat molecules with oxygen of the air to form highly reactive peroxide derivatives, which would in turn transfer part of their molecular energy to inactive fat molecules to make them reactive to the end that, in the absence of an antioxidant, from 1,000 to 10,000 fat molecules might be made reactive and become oxidized, with the development of rancidity.

F. C. Vibrans, Institute of American Meat Packers, identified the active oxygen test as the one most used in present-day laboratories to estimate the relative keeping qualities of edible fats and oils. The Schaal test was given as the one quite generally used specifically in bakery laboratories.

Lucius W. Eler, Jr., General Foods Corp. Laboratories, Hoboken, N. J., classified the development of rancidity

CAPITAL VIEWS

SUGAR COATED TNEC—Industry has been cooperating so well with the government on defense matters that Senator O'Mahoney, chairman of the Temporary National Economic Committee, has decided that they should not be disciplined by further antitrust criticism through the TNEC report. This mildness in monopoly matters is not imitated at the Department of Justice. That government agency is vigorously pressing various antitrust suits, especially those affecting food distribution.

DRAFTED MEN'S RIGHTS— In hiring and firing of personnel within the conscription age limits it is important that personnel officers note new legal restrictions. Not all of the details affecting such men have been worked out. But already it is evident that the employer must accept certain responsibilities for reemployment after military training, and must protect seniority, insurance and social security privileges in accordance with the law. One can anticipate a few more gray hairs in the legal and personnel offices of food companies.

SWEETNESS AND TEMPERATURE— In discussing the replacement of sucrose by other sweeteners there has been much talk about the importance of sweetness. All of the testimony and discussion seems conclusively to prove that the measurement of sweetness of foods or food ingredients is extremely difficult. This difficulty is greatly increased because the relative sweetness of two compounds changes with concentration in the sirups. Recently there is experimental evidence that the sweetness changes also with temperature. This fact makes important the determination by manufacturers as to how sweet they want their product to appear to be under the normal conditions under which it is served to the ultimate eaters. Thus, the sweetness question gets more complicated than ever for the formula maker.

PUBLICITY CLUB — Government officials are going to use publicity as a club over prices. Already Leon Henderson, industrial price policeman of the Defense Commission, has appeared to achieve his desire by frank comment on the prices of copper, lead and zinc. Miss Harriet Elliott, retail price police-lady, expects to use the consumer movement, which gives a gorgeous megaphone for her price criticisms, if any.

SPECIAL FOOD TAXES — While Congressmen are at home between now and January, food manufacturers may wish to discuss with them some of the special tax problems of the industry. Along with other new taxes there is very good chance that Congress will seriously consider certain processing taxes and new chain store taxation, beginning next January. Those elected in November will be the ones to be educated as to the impact of these problems in their own districts. They can then vote intelligently when these special food tax questions arise in Congress.

ICC TRUCK RULES — Many privately owned trucks are now subject to federal supervision. It is important, therefore, to determine in the case of each truck fleet which, if any, units must meet the new ICC safety regulations. Some food manufacturers are sure to find this is one more complication from Washington.

UP-GRADING WORKERS–Regardless of the political irreplaceability of some folks, the conscription boards have been told that there is no such thing as irreplaceable plant workers. This will be particularly true of ordinary manufacturing plants that are not making things specially for the defense program. Immediate plans for training of substitute specialists and upgrading of juniors to take larger responsibility may be necessary. To anticipate when workers are likely to be called for military training it is important that each management make up a file of the order in which their individual workers may be called. As soon as the draft lottery has been carried out, each worker should determine and report to his chief on this question. Those likely to be called early should be consulted as to their availability, dependents, and so forth.

SUPREME COURT CASES–Many cases involving important fundamental principles will be decided by the Supreme Court in the term just beginning. One outstanding issue on food plant labor is involved in the case of H. J. Heinz Co. That concern will thus learn from the Court whether the law requires that it make a written agreement with its employees.

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CASTERS & WHEELS

DARNELL E-Z Roll Wheels and Double Ball-Bearing Casters assure the easy handling of the heaviest loads. They are economical too! Soon paying for themselves by saving floor, equipment, time and energy. It will pay you to Darnell-ize.

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CONSTRUCTION NEWS

	Pending (thousands)	Awarded October (thousands)	Total Awarded 1940 (thousands)
Bakery	$95	$100	$2,280
Beverages	1,420	726	6,930
Canning and Preserving	.....	50	463
Cold Storage Plants	295	.....	670
Confectionery	.....	.....	570
Grain Mill Products	2,440	175	3,614
Ice Manufactured	.....	.....	271
Meats and Meat Products	160	445	2,280
Milk Products	440	80	1,689
Miscellaneous	1,240	275	5,271
	$6,090	$1,851	$24,038

in flaked breakfast cereals as being quite different from that in shortenings and related oils. The solution of the problem of rancidity in cereal flakes is viewed as resting more heavily upon a study of colloidal or physical characteristics of the flake surface than upon strictly chemical auto-oxidation as influenced by antioxygens.

R. R. King, Interstate Cotton Oil Refining Co., Sherman, Tex., reported that cottonseed oil in the refined state is preferred over the crude oil for industrial storage.

Two New Standards Put Into Washington Works

For oleomargarine and chocolate products. Action on others

TWO NEW DOCKETS have been started in a series of food standards proceedings. One of these is to establish a definition and standard of identity for oleomargarine. The hearing begins November 18 with Edward B. Williams as presiding officer. The F&DA proposals were printed in the *Federal Register* for October 11.

The other new docket is to consider definitions and standards of identity for chocolate products. The hearings begin December 9, with M. F. Markel presiding. The text of the proposed standards is given in the *Federal Register* for October 19. The products included are cacao nibs; chocolate liquor; sweet chocolate (coating); skim milk chocolate (coating); buttermilk chocolate (coating); mixed milk, skim milk, buttermilk, malted milk chocolate (coating); cocoa; breakfast cocoa; low-fat cocoa; sweet cocoa and fat (other than cacao fat) coating; and sweet chocolate and fat (other than cacao fat) coating.

As announced last month (FOOD INDUSTRIES, October, page 74), the flour standards hearing will be reconvened on November 12 for further consideration of flour, self-rising flour, phosphated flour, farina and semolina. The proposed standards for these foods were published in the *Federal Register* of August 3.

Proposed findings of fact and regulations for four kinds of cheese (dockets 11 and 12) were issued in the October 2 *Federal Register*. Exceptions to the proposed orders could be filed until October 18.

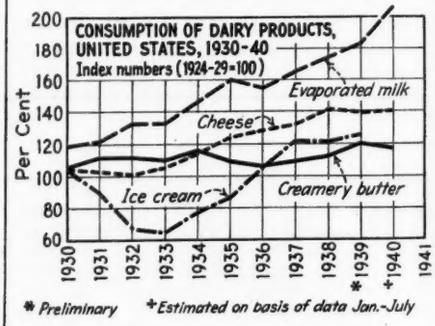
The effective date of the standard of identity for dried skim milk has been postponed from October 10 to January 7.

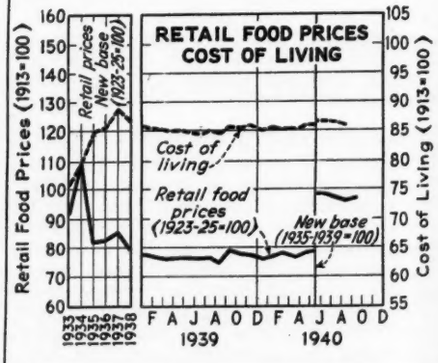
The proposed findings of fact and order for the addition of sodium benzoate as a preservative in catchup appeared in the *Federal Register* for October 17. It is recommended that no amendment of the definition and standard of identity for tomato catchup be made.

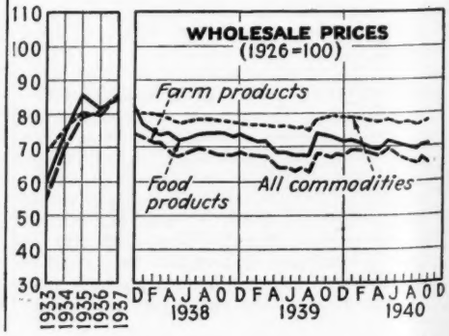
The transcript of the canned fruits testimony was filed October 22. Briefs in this case must be filed not later than December 11, 50 days after the filing of the transcript.

Food Commodity Prices Remain Stationary

The month from mid-September to mid-October showed practically no change in food commodity prices, with the *N. Y. Journal of Commerce's* price from 68.2 to 68.3. In contrast the general commodity price index of the same index for food commodities rising only


CONSUMPTION OF DAIRY PRODUCTS, UNITED STATES, 1930-40
Index numbers (1924-29=100)
Per Cent
Evaporated milk
Cheese
Ice cream
Creamery butter
1930 1931 1932 1933 1934 1935 1936 1937 1938 *1939 +1940 1941
* Preliminary
+ Estimated on basis of data Jan.-July


Retail Food Prices (1913=100)
Retail prices New base (1923-25=100)
RETAIL FOOD PRICES
COST OF LIVING
Cost of living
Retail food prices (1923-25=100)
New base (1935-1939=100)
Cost of Living (1913=100)
1933 1934 1935 1936 1937 1938
F A J A O D F A J A O D
1939 1940



publication increased from 79.1 to 80.5 during the month.

Among the individual commodity prices, more change was evident. Wheat, No. 2 dark winter, increased from 73½c. on September 17 to 80½c. on October 17. Flour upped from $4.75 to $5.10 in the same period. Butter gained from 28¼c. to 30¼c., sugar from $2.70 to $2.78, cocoa from $4.48 to $4.63, and coffee from 6⅝c. to 6⅞c. Among the decreases during the month were lamb from 17c. to 15c., and lard from $5.45 to $5.30. Other important food commodities showed little change.

Food Exports Show Marked Changes

Changes in normal trade relations caused by Great Britain's blockade of European countries and by war-influenced shifts of source and type in Great Britain's food supply, are making definite changes in U. S. food exports.

Great Britain formerly bought large supplies of fresh, canned and dried fruits from this country. Now these products can only be shipped to Great Britain on license, and licenses are generally not forthcoming. In consequence, U. S. exports of canned fruits in August, 1940, were 1,239,000 lb., compared to 35,859,000 lb. in August, 1939; of dried fruits, 4,004,000 lb., compared to 25,136,000 lb.

The same factors served to lower U. S. exports of lard from 22,848,000 lb. to 10,181,000 lb.; and of cured hams and shoulders from 5,132,000 lb. to 786,000 lb.

In contrast, blocking of The Netherlands from export of canned milk increased U. S. canned milk exports for August, 1940, to the record figure of 56,332,000 lb., of which about 85 percent went to the United Kingdom. Canned salmon exports to Great Britain also increased, bringing U. S. exports of this commodity up to 7,548,000 lb. for August, 1940, compared to 2,888,000 lb. a year before. Exports of cornstarch also increased to 24,575,000 lb. from 18,114,000 lb. for August of the preceding year.

On the whole, total food exports showed a decline in August, 1940, as

Data for the Charts

In preparing the curves shown on this and the succeeding page of Food Industries, data were obtained from the following sources: Prices received by farmers, U. S. Department of Agriculture; employment, payrolls, wholesale and retail prices, U. S. Department of Labor; cost of living, National Industrial Conference Board; commodity price index, *N. Y. Journal of Commerce*; business activity index, *Business Week*; consumption index for dairy products, U. S. Department of Agriculture.

Views of the Budweiser Distribution Plant in Los Angeles. Mundet Corkboard insulates the refrigerated storage space shown at top.

ECONOMY for Users of Refrigeration

When Anheuser-Busch, brewers of Budweiser, built their modern distribution plant in Los Angeles, Mundet Corkboard was specified for low temperature conservation. The insulation was supplied through the Mundet district office and warehouse, 1850 N. Main Street, Los Angeles. Here, as in other principal cities, Mundet maintains responsible engineering and installation services covering all phases of refrigeration insulation.

The fact that Mundet Cork Insulation is serving prominent firms in every industry where low temperature is required—and has rendered this service for many years—is an indication of its worth. Let us show you now how you can profit from Mundet Insulation Products and Services. Our recommendations do not obligate you to purchase. Mundet Cork Corporation, Insulation Division, 65 S. Eleventh Street, Brooklyn, N. Y.

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How Thousands of Dairy Product Plants Keep Bacteria Counts Low with Oakite Cleaning Materials

OAKITE MILKSTONE REMOVER: A big time and money-saver! Eliminates need of long, hard scrubbing and scouring with abrasives to remove milkstone and casein from pasteurizers, coolers, heat exchangers, storage tanks, etc. Successfully removes bacteria-harboring milkstone deposits thoroughly, quickly . . . SAFELY!

OAKITE BACTERICIDE: A superior germicidal material that surrounds product quality with WIDER MARGIN of protection against high counts. Due to its MORE ACTIVE form of available chlorine, it swiftly destroys bacteria and mold growths on processing equipment, thus providing more COMPLETE CONTROL over contaminating organisms.

OAKITE COMPOSITION NO. 30: If washing milk, cream or ice cream cans is a problem in your plant, this material will prove a money-saving answer. Its vigorous yet SAFE cleaning action thoroughly, speedily removes butter fat and other deposits, leaving cans CLEAN, BRIGHT, SWEET-SMELLING, film-free. Extremely economical either for washing cans by machine or manual methods.

FREE BOOKLETS GIVE FACTS

Decide today to investigate how these time and money-saving materials can help you, too, control bacteria more effectively, step-up cleaning efficiency and cut sanitation costs. Fact-filled booklets giving successful formulas and methods are yours FREE! Write today!

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compared to a year earlier, from a value of $24,236,000 to $19,095,000. Food imports were also off for the month, from $48,382,000 to $42,102,000. Coffee and cocoa were two important food commodities imported in greater quantity in August of this year.

October Estimates Show Higher Crop Yields

Continued favorable growing weather in September boosted most expected crop yields above even the high estimates of September 1. Figures for October 1 show that grain crops, in particular, benefited from the weather. Corn output was placed, in the October 10 figures of the Crop Reporting Board, at 2,352,185,000 bu., compared to 2,297,186,000 bu. estimated a month before. Wheat production was boosted to a total of 792,332,000 bu. for the year. Oats advanced again, from 1,206,901,000 bu. to 1,218,273,000 bu. And barley upped slightly, from 304,955,000 bu. to 308,021,000 bu.

Other increases noted in the estimates included: Potatoes, from 383,172,000 bu. to 389,091,000 bu.; sugar beets, from 10,649,000 tons to 11,076,000 tons; hops, from 39,280,000 lb. to 40,260,000 lb.; apples, from 114,830,000 bu. to 115,162,000 bu.; and pecans, from 76,651,000 lb. to 81,829,000 lb.

Estimates for some crops, however, showed small decreases. Important among these were rice, from 52,280,000 bu. to 51,397,000 bu.; dry beans, from 15,133,000 bags to 14,977,000 bags; peanuts, from 1,551,150,000 lb. to 1,539,540,000 lb.; and soybeans, from 85,509,000 bu. to 81,541,000 bu.

Fewer Soybeans Expected

Soybeans and soybean oil will probably cost more this winter than had been expected. A combination of late spring planting, summer drought and early fall is responsible for a much smaller crop of soybeans than forecast a few months ago. As of October 10, the estimated harvest for the 1940 season was approximately 82,000,000 bu. of soybeans, compared to over 85,000,000 bu. in the estimate a month before, and to about 90,000,000 bu. harvested in 1939.

Apparently, the harvest will be inversely proportional to the 1940 acreage, which was 14 percent greater than in 1939. However, cutting off of important export markets this year will partially offset this reduction, making several million extra bushels domestically available. Soybean oil output will probably not vary greatly from that of last year.

Some Canning Crops Up

Better weather in September and October considerably improved the output prospects of some canning crops. Beet output for canning, for example,

is expected to reach 74,110 tons, a new record, comparing to only 44,740 tons in 1939 and 5 percent over 1938, the previous record year. Sweet corn tonnage for canning improved to 724,000 tons, compared to 661,100 tons in 1939. And cabbage for kraut is expected to total 158,600 tons, compared to 146,600 tons last year.

In contrast, tomatoes for canned tomato products are expected to be only 1,801,500 tons, 10 percent below the 1939 output. And green lima beans for processing are put at 27,640 tons, compared to 29,790 tons in 1940.

INDICATORS

SUGAR DELIVERIES by refiners, beet processors and importers for the first eight months of 1940 totaled 4,435,312 short tons, raw value, compared to 4,271,690 short tons for the same months of 1939, according to the report of the AAA Sugar Section.

SUGAR BEET CROPS in 1940 are expected to reach 11,076,000 tons, second highest output on record, and comparing to 10,773,000 tons harvested last year.

CONFECTIONERY and competitive chocolate products sales in August, 1940, by 215 manufacturers, are reported at $17,050,000 by the Bureau of the Census. This is 8 percent above sales by the same manufacturers in August, 1939.

FLOUR PRODUCTION in September, 1940, according to the *Northwestern Miller*, by mills accounting for 64 percent of total United States production, was 6,003,879 bbl., compared to 7,395,103 bbl. in September, 1939.

RED SOUR PITTED CHERRY PACK in 1940 is reported at 3,422,873 cases, compared to 3,137,545 cases last year.

SALMON packed in Alaska, up to September 15, 1940, totaled 4,965,756 cases, compared to 5,146,659 cases during the corresponding period last year.

MILK PRODUCTION in September, 1940, is reported by the U. S. Department of Agriculture to have been the highest ever reported for that month, and on October 1 was 6 percent above the corresponding figure of the previous year.

EGG PRODUCTION in September, 1940, was 2,504,000,000 eggs, 6 percent larger than the September, 1939, output and 9 percent above the ten-year September average.

OLEOMARGARINE sales in August, 1940, as indicated by sales of internal revenue stamps, totaled 21,224,706 lb., compared to 22,867,124 lb. a year before.

BUTTER, creamery, produced in August, 1940, was reported at 163,715,000 lb., compared to 164,860,000 lb. in August, 1939, and to an 1930–1938 average of 152,895,000 lb. for the month.

CHEESE, American, produced in August, 1940, totaled 57,635,000 lb., 6 percent above August, 1939, output and 32 percent above the 1930–1938 August average.

COTTONSEED OIL consumption in September, 1940, was 276,731 bbl., compared to 462,188 bbl. in September, 1939.

PEANUT PRODUCTION in 1940 is said to be the largest on record, and 31 percent greater than a year ago.

WINE CONSUMPTION in the United States, in 1939, is now reported to have been 0.59 gal. per capita, equaling the highest consumption recorded prior to prohibition.

CORN GRIND in September, 1940, was reported by Corn Industries Research Foundation at 5,937,663 bu., compared to 7,587,756 bu. in September of last year.

TURKEY PRODUCTION in 1940 is expected to be over 33,000,000 birds, up 1 percent over the 1939 crop.

BEER PRODUCTION, first eight months of 1940, was 38,757,973 bbl., about 1 percent below the 1939 output for the corresponding period.

FRUITS, FROZEN, in storage on October 1, 1930, totaled 160,809,000 lb., compared to 142,087,000 lb. a year before and a 1935–1939 average of 117,403,000 lb. for the date.

VEGETABLES, FROZEN, in storage on October 1, 1940, were 81,107,000 lb., compared to 78,260,000 lb. on October 1, 1939.

BUTTER, CREAMERY, in storage on October 1 of this year was 127,971,000 lb., compared to 154,594,000 lb. a year before and to a 1935–1939 average of 148,330,000 lb. for the date.

CHEESE, all kinds, in storage on October 1, 1940, amounted to 148,616,000 lb. The figure on October 1 last year was 116,561,000 lb. and the 1935–1939 average was 120,975,000 lb. for the date.

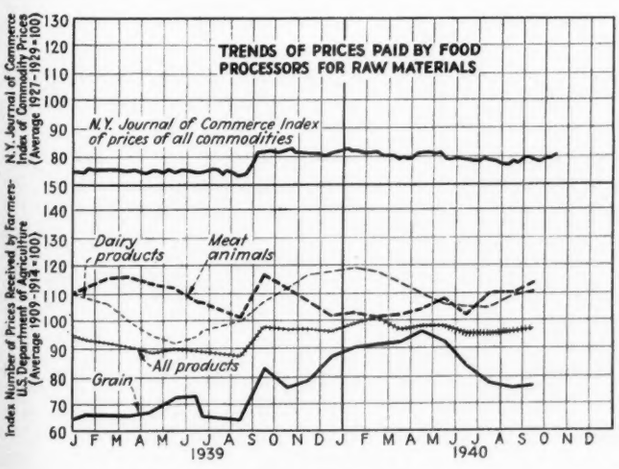
EGGS, case equivalent, in storage on October 1, 1940, totaled 9,771,000 cases, compared to 8,901,000 cases on October 1, 1939, and to an average of 9,172,000 cases for the same date in 1935–1939.

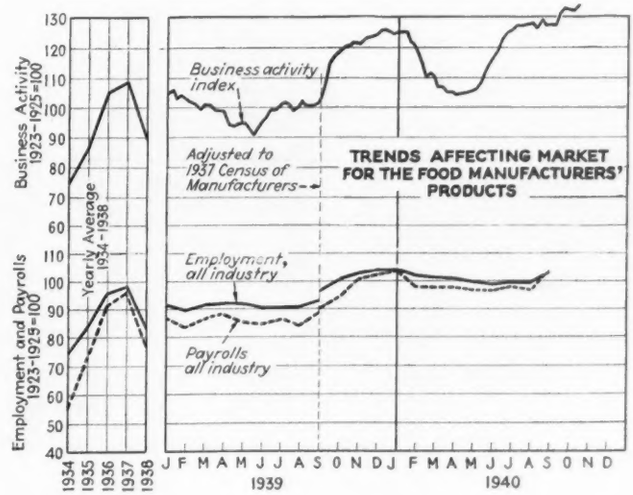
POULTRY, FROZEN, all kinds, in storage on October 1 of this year was 90,446,000 lb., compared to 63,164,000 lb. on October 1 last year. The 1935—1939 average for October 1 was 61,328,000 lb.

MEAT, all kinds, in cure and frozen storage on October 1, 1940, totaled 426,768,000 lb., compared to 399,500,000 lb. on October 1, 1939, and to a 1935—1939 average of 407,017,000 lb. for the date.

LARD in storage October 1, 1940, was 234,594,000 lb. This figure compares to 78,794,000 lb. a year ago and to an October 1 average for 1935–1939 of 77,700,000 lb.

WEEKLY INDEX of Wholesale Food Prices of Dun & Bradstreet stood at $2.33 on October 15, the highest this year since May 7 and comparing to $2.43 on October 15, 1939.


TRENDS OF PRICES PAID BY FOOD PROCESSORS FOR RAW MATERIALS
N.Y. Journal of Commerce Index of prices of all commodities
Dairy products
Meat animals
All products
Grain
N.Y. Journal of Commerce Index of Commodity Prices (Average 1927-1929=100)
Index Number of Prices Received by Farmers-U.S. Department of Agriculture (Average 1909-1914=100)
J F M A M J J A S O N D J F M A M J J A S O N D
1939
1940


Business Activity 1923-1925=100
Yearly Average 1934-1938
Employment and Payrolls 1923-1929=100
1934 1935 1936 1937 1938
Business activity index
Adjusted to 1937 Census of Manufacturers
TRENDS AFFECTING MARKET FOR THE FOOD MANUFACTURERS' PRODUCTS
Employment, all industry
Payrolls all industry
J F M A M J J A S O N D J F M A M J J A S O N D
1939
1940

Research for Profit

(*Continued from page* 31)

responsibility of providing its trained personnel with the latest tools and facilities of their profession. The personnel should also be protected from petty nuisances by efficient administrative work by a capable research department office staff.

In general, research men are not skilled in making contacts with the business world. Contacts of this kind can be encouraged by research management by making frequent meetings easy and pleasant for the scientific staff. This will be of great help in preventing the research men from being classed as "queer ducks" by the rest of the organization—a state of affairs which prevails in too many instances. It is a source of great satisfaction to a research director when he hears a foreman say, "Let's put this one up to the research department—those boys will knock this problem off in about a week."

In conclusion, the fundamentals of organizing a research department for profit are very simple. They may be enumerated as follows:

1. A capable top management alert to the possibilities of research and at the same time having a knowledge of research limitations.
2. A research policy defining the scope of the research and the financial limitations upon it.
3. Personnel carefully selected with an eye to the problems to be solved.
4. The necessary research tools and facilities for carrying out the work.
5. Research department management which is capable of not only directing research intelligently, but also of selling the results of this research to its management. Such research management should have a touch of what has been called "the low commercial mind."
6. Capable research administration which includes a budget control system—simple and readily understandable both by research personnel and management.

Research organized on the basis of the above fundamental necessities can seldom fail to be profitable.

Digest of A.M.S. Standards

(*Continued from page* 56)

sirup tests 25 deg., or over, Brix. "Heavy sirup" means that the sirup tests 21 to 25 deg. Brix. "Medium sirup" means that the sirup tests 16 to 21 deg. Brix. "Light sirup" means that the sirup tests 12 to 16 deg. Brix. "Water Pack" means that the packing media tests less than 12 deg. Brix.

NOTE:—It is suggested that buyers using these grades as the basis of purchase should indicate the desired density of sirup in their contracts.

The maximum head space and the minimum drained weight allowable in the cans commonly used in packing canned sweet cherries are tabulated in the standards. Cans of sweet cherries meeting the drained weight requirements that have not been packed as full as possible without impairment of quality will be certified "Below Standard in Fill."

In determining compliance with the drained-weight requirements, tolerances shall be allowed for sweet cherries packed in heavy sirups. In addition, if the average drained weight of cans of a sample complies with these requirements, the sample will be certified without exception.

The maximum number of sweet cherries per can and the maximum variation in the number of cherries per can shall correspond to a table in the standards. Official certificates of grade will indicate the range of count of the cans graded.

The grade of canned sweet cherries may be ascertained by considering, in addition to the foregoing requirements, the following factors[2]: color (25 points), uniformity of size and symmetry (20 points), absence of defects (20 points) and character of fruit (35 points).

The factor "absence of defects" has reference to the character of workmanship in the preparation of the product, and the degree of freedom from damage. The term "damage" refers to slight rain checks or cracks, callous tissue, hail damage, limb rubs, wind whips, bird pecks and cherries torn at the stem. "Serious damage" includes deep rain checks or cracks, bruised cherries, unsightly scab and sun-scald. Deep rain checks or cracks are cracks whose combined length and width exceeds one half of an inch. A skin discoloration having an aggregate area not exceeding that of a circle $\frac{3}{16}$ in. in diameter and not extending into the fruit tissue is not considered a defect. Pitted cherries may not have more than 1 pit per each 20 oz. of net contents.

Under the factor "character of fruit," consideration is given to the meatiness and texture of the cherries, and their tendency to retain their original conformation without material disintegration. The condition of the flesh—its firmness or tenderness—is to be noted in this connection.

ISSUED, May 3, 1940.
EFFECTIVE, May 15, 1940.

Microbial Contents of Spices

(*Continued from page* 52)

when first treated, after 20 months storage showed much smaller numbers of yeast and mold than when first examined.

Results indicate that, in general, untreated spices stored for a 20-month period show a tendency to increase in their bacterial numbers, but spices treated with ethylene oxide before being stored show a decrease. Where there is a lack of difference between duplicate samples tested 20 months apart, the microbial flora present on spices existed largely in a dormant stage. Therefore, spices whose microbial numbers have been markedly reduced by the ethylene oxide treatment are not likely to become "recontaminated" under normal storage conditions.

Separation vs *Complete Destruction*

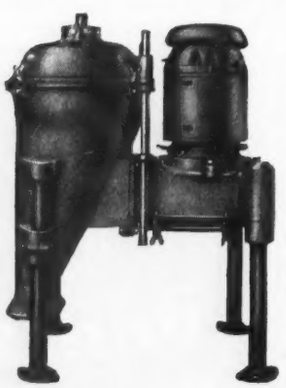
WHEN INSECT INFESTATION IS REMOVED BY SEPARATION IT IS STILL PRESENT IN THE MILL, ALIVE AND READY TO RE-INFEST YOUR FLOUR

ENTOLETE *your flour*

DESTROY INSECT INFESTATION AS PART OF THE MILLING PROCESS

SECURE COMPLETE DESTRUCTION OF INSECT LIFE, IN ALL STAGES; EGG, LARVA, PUPA AND ADULT

By the Bulk Flour **ENTOLETER** INFESTATION DESTROYER

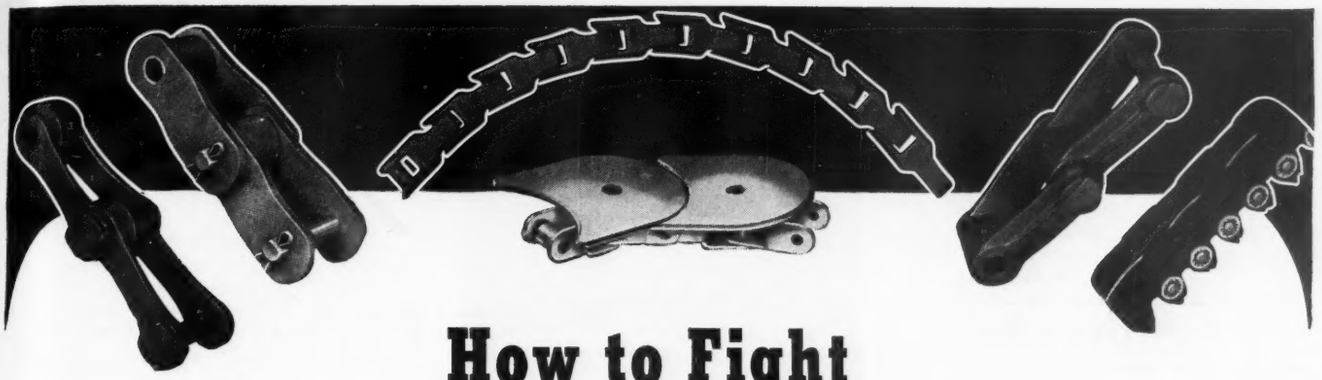


Inexpensive—Easy to install and operate—Minimum Maintenance

ENTOLETER DIVISION

THE SAFETY CAR HEATING AND LIGHTING COMPANY, INC.

230 PARK AVENUE **NEW YORK, N. Y.**



How to Fight Corrosion—Abrasion—Contamination With LINK-BELT CHAINS FOR DRIVES AND CONVEYORS

● Auxiliary to the standard lines of Link-Belt chains, we manufacture chains of many different metals for meeting unusual service requirements.

Promal chains, under either normal or abrasive wear, will last several times as long as the corresponding sizes and weights of malleable chains, although costing but a fraction more. They can be substituted for malleable chains without change of type, size or weight, or replacement of wheels.

Malleable chains are resistant to mild corrosive attacks. These can be improved by cadmium plating, galvanizing, tinning, or some equivalent treatment.

When the corrosive action is more intense, copper bearing malleable, copper bearing Promal, or malleable alloyed with copper and some other alloying element, will serve as preventives.

Where the corrosive attack is of greater severity, chains made in manganese bronze, phosphor bronze, aluminum bronze, stainless steel, or chrome nickel alloys, can be advantageously used.

For handling food products where contamination must be avoided, Link-Belt chains of special metals are available. The avoidance of pockets and depressions in their design also make them easy to clean and keep clean.

As a result of many years or research work in our laboratories, and with a knowledge of the performance of the different metals in service, we are prepared to serve as a consultant when such problems are encountered. Make use of Link-Belt's world-wide experience and complete facilities in the solution of your problems. Write us today!

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The Leading Manufacturer of Equipment for Handling Materials and Transmitting Power

INDIANAPOLIS, Ewart Plant, 220 S. Belmont Ave. INDIANAPOLIS, Dodge Plant, 519 N. Holmes Ave. CHICAGO Plant, 300 W. Pershing Rd.
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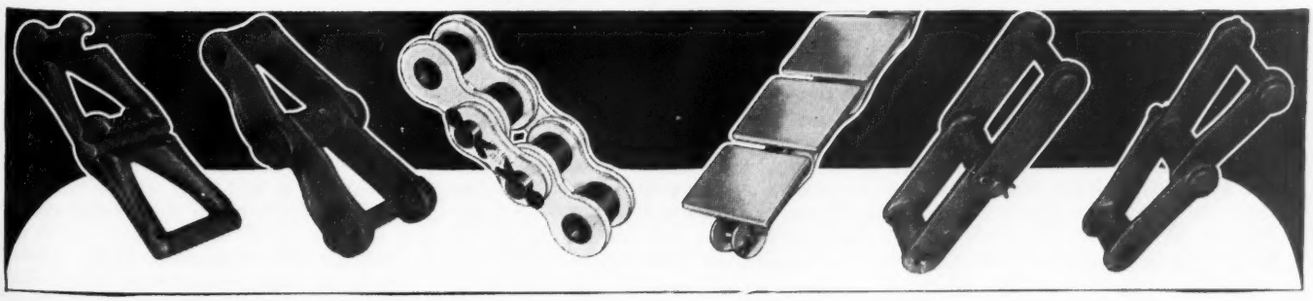
DALLAS Plant, 500 Latimer St. ATLANTA Plant, 1116 Murphy Ave., S. W.
Offices, Warehouses and Distributors in Principal Cities. In Canada—Link-Belt Limited—Toronto Plant: Montreal; Vancouver; Swastika



Men, Jobs & Companies

INDUSTRY

Belt Line Cold Storage, Inc., Charles Town, W. Va., is building a modern, direct-ammonia, insulated, double-tile-wall, apple cold storage plant at Ranson, W. Va. It will be located next to the Bly-Robinson Co. apple packing house.

Best Foods, Inc., has opened a new research and development laboratory at Bayonne, N. J., completed at a cost of $150,000.

BobWhite Frosted Foods Corp., New York, has leased an ice cream plant at Hollis, N. Y. It will manufacture ice cream which formerly was made by others and marketed under the Bob-White label. The firm will also process frozen foods in the new plant.

Brooklyn Bridge Freezing & Cold Storage Co., New York, has installed a quick-freezer for fish fillets, shrimp and other seafoods. The new quick-freezer, a "Flexible Froster", utilizes a flexible rubber bag, filled with circulating low-temperature brine for heat extraction by contact. It permits the handling of odd-shaped products.

Coca-Cola Bottling Co., Oshkosh, Wis., is erecting a new bottling plant and distributing depot at a cost of $115,000.

Coshocton (Ohio) Creamery Co. has moved into a new plant that has approximately 7,000 sq.ft. of floor space. The company has added one new 600-gal. pasteurizer and one 1,000-lb. churn to its equipment.

Dietetic Flour Mills, Inc., which bought the old Weyauwega (Wis.) Milling Co. last summer, is installing new machinery for the manufacture of soybean flour. A. L. Nichols is head of the firm.

Dubuque (Iowa) Packing Co. will build an addition to its plant; including a killing room and cooler builder, at an estimated cost of $250,000.

Friend Bros., Inc., manufacturers of brick-oven baked beans, has nearly doubled the size of its Malden, Mass., plant by a recently completed addition.

Goodman Brothers, manufacturer of wine jellies, date and nut spreads, sauces and pickled onions, has moved from Hartford to Meriden, Conn. Plant floor space is 13,000 sq.ft., as compared with 5,500 sq.ft. at its former location.

JAMES L. DAVIDSON

Plant chemist of Ohio Milk Sugar Co., he has been appointed manager of the factory which was recently constructed at Belle Center. The plant is said to be one of the largest milk sugar factories in the world.

TALBOT O. FREEMAN

Associated with Pepsi-Cola Co., Long Island City, N. Y., for nearly a year as its franchise head, Mr. Freeman has been elected vice-president in charge of the franchise department. He has also continued his past interest and experience in aviation by directing the company's sky-writing program.

Hood River Apple Growers' Association will can apple juice and apple sauce at its Hood River, Ore., plant.

Jarex Fish Products Co. has started commercial production of an old Bohemian delicacy, "gefilteh fish," in a plant at Sandusky, Ohio, after two years of experimental production and marketing from a small plant in Boston. The product consists of a combination of three or four kinds of fresh-water fish, filleted, the fillets chopped together with vegetables and seasoning, and the mixture formed into balls and cooked. The product is packed in glass jars.

Mother Hubbard Products Co., Chicago, has purchased the Wabash (Ind.) Baking Powder Co. Production operations of the Wabash concern will be moved to Chicago.

Southern Canning Co., Cavetown, Md., has started the canning of soybeans as a result of the observations of the plant superintendent, J. C. Shaver, that soybeans appeared on the menus of a number of Southern restaurants.

Stokely Bros. & Co's tomato cannery at Martinsville, Ind., was destroyed by fire on Oct. 6 at a loss which firemen said might reach as high as $1,000,000. Only a brick powerhouse was left standing among the several buildings which comprised the plant. The company declined to place an estimate on the loss.

Swift & Co., Chicago, will build a five-story addition to its packing plant facilities at Cleveland, at an approximate cost of $75,000 or more. It will also construct a $50,000 packing unit at Moultrie, Ga.

PERSONNEL

Evan W. Carroll, vice-president and general manager of Dr. Pepper Bottling Co., Inc., Memphis, has resigned to devote his time to Dr. Pepper plants in Dyersburg, Tenn., and Mayfield, Ky. Supervision of the Memphis plant will be combined with the one in San Antonio, with W. R. Briggs as manager.

Henry H. Cate has been named executive vice-president of Tex-O-Kan

Flour Mills, Dallas. He has been general manager of Houston (Tex.) Milling Co.

Dr. Michael A. Farrell has become head of the new Department of Bacteriology (formerly a division in the Department of Dairy Husbandry) of Pennsylvania State College.

Harvey L. Henderson has opened a large packing house at Eagle Lake, Fla., after a thorough remodeling and reconditioning. The packing house will handle the fruit under control of Eagle Lake Growers, Inc., which Mr. Henderson heads.

W. C. Holbert, Indianapolis branch manager of Geo. A. Hormel & Co., has been transferred to the firm's headquarters at Austin, Minn.

Clinton E. Kafka, director of store operations, National Tea Co., Chicago, has resigned after 24 years with the company. During most of this period he was production manager of the Chicago plant.

Ross H. Lamb will convert the Hungerford Smith plant at Benton Harbor, Mich., recently purchased from Welch Grape Juice Co., into a modern winery with a 3,000,000-gal. capacity.

French T. Maxwell and Carl S. Nadler have been elected directors of South Porto Rico Sugar Co., New York. Mr. Maxwell was also named chairman of the Dominican subsidiaries, and Mr. Nadler, who has been assistant to Mr. Maxwell, was made president of South Porto Rico Sugar Co. of Puerto Rico.

Don McFarland has been appointed superintendent of American Packing and Provision Co., Ogden, Utah. He replaces Andy Wolf, retired.

R. L. Melrose, branch manager of Imperial Ice Cream Co. at Bluefield, W. Va., has been promoted to Washington, Pa., where he will manage the company's plant.

Edward B. Orr, has been appointed manager of Borden's Castle Ice Cream Co. at Topeka, to succeed George A. Bigler.

DEATHS

James G. Brennan, 40, superintendent of the Brennan division of Wilson & Co., Chicago, Oct. 14.

Joseph P. Frisbie, 62, president and treasurer of Frisbie Pie Co., Bridgeport, Conn., Oct. 2.

Ollie Gilliatt, 60, vice-president of Vincennes (Ind.) Packing Corp., Oct. 7. At the time of his death he was a member of the Administrative Council of National Canners Association.

CLAUDE A. BASCOMBE

Standard Brands, Inc., New York, has appointed him manager of its department of public relations. Mr. Bascombe has been assistant manager of the bakery sales department.

V. E. McArthur, 57, president of Lincoln (Neb.) Packing Co. and of Hutchinson (Kan.) Meat Packing Co., Sept. 21.

Howard C. Morgan, 50, president of Crystal Canning Co. of Frankfort, Mich., and vice-president of John C. Morgan Co., Traverse City, Oct. 15 He had acted as president of Michigan Canners Association and as a director of National Canners Association.

Tolbert N. Richardson, 63, president of Thomas D. Richardson Co., Philadelphia, Sept. 24.

ASSOCIATED INDUSTRIES

Anchor Hocking Glass Corp. has opened a plant at Los Angeles which is its first Western closure factory.

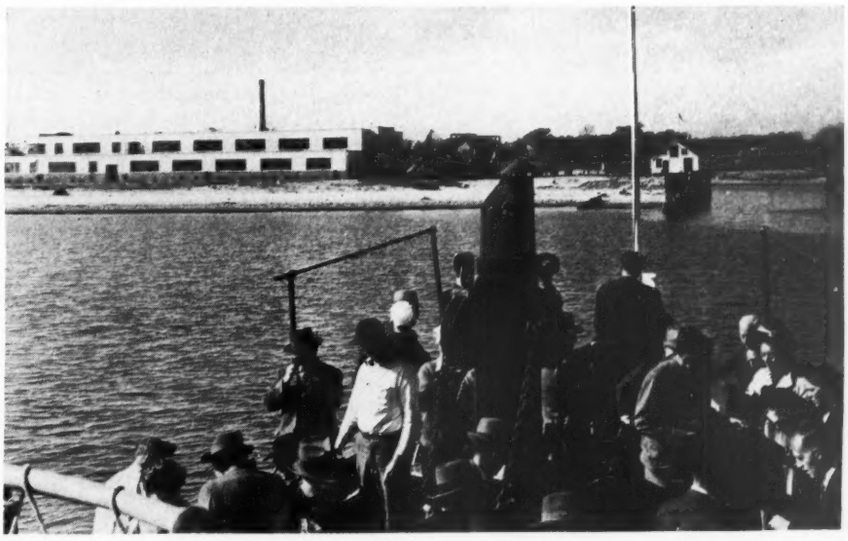
Cincinnati Butchers' Supply Co. has moved into a new plant which will give the company better manufacturing facilities.

George S. May Business Foundation, Chicago, has announced that certain reports on current management problems, including "An Analysis of the Brewing Industry", are now available.

Packaging Institute, Inc., has elected Carl H. Lambelet, president. He is president of New Jersey Machine Corp., Hoboken. George R. Webber, package development bureau, Standard Brands, Inc., Hoboken, was named as one of the vice-presidents.

Claude B. Schneible Co., Chicago, has appointed H. L. Bullock as its New York and Philadelphia representative in dust control problems.

George Switzer, industrial designer, New York, died Oct. 8, at Prattsville, N. Y. Among his many designs was one for Geo. A. Hormel & Co. which won an award in the 1937 "All-America Package Competition."



OPENS NEW $200,000 OYSTER PLANT

Part of the crowd is here shown who witnessed the official opening on October 11 of Bluepoints Co.'s new $200,000 oyster packing plant at Greenpoint, L. I. The old plant is the small building to the right. The new one to the left, which is equipped with the latest in production methods, is a two-story structure of buff brick and white stuccoed block walls, 120x192 ft. The structure just to the right of the new plant is conveying equipment which can transfer 1,200 bu. of oysters an hour from the boats into the plant. The whole layout of the Bluepoints' oyster farm and plant is such that a year around production is assured. Bluepoints Co. is a subsidiary of General Foods Corp.

Just off the Press

BOOKLETS • LITERATURE • BULLETINS

Food Plant Equipment

CANDY PLANT EQUIPMENT—Cooking kettles, tanks, beaters, utensils and other equipment made from Monel metal for use in the manufacture of candy are described in a series of leaflets issued by the International Nickel Co., 67 Wall St., New York, N. Y.

FILTERING EQUIPMENT—Seitz sheet filters for application to products such as wine, cider, vinegar, beer, fruit juices, vegetable juices and similar liquids are described with specifications in a bulletin of American Seitz Filter Corp., Paterson, N. J.

MATERIAL HANDLING EQUIPMENT—Redler conveyors and conveyor-elevators for conveying and elevating pulverized, granular, small lump or flaky material in any direction are described and specifications given in 60-page Catalog No. 140 of Stephens-Adamson Mfg. Co., Aurora, Ill.

PACKAGING MACHINERY—In Bulletin 106, 40 photographs of filling, packaging, weighing, sealing, cartoning and other packaging equipment, are shown by Pneumatic Scale Corp., Ltd., North Quincy, Mass.

SCREENING EQUIPMENT—The "Ro-Ball" gyrating screen, arranged for one, two, three, four or five separations of wet or dry material, is described with specifications in Bulletin 376, issued by the J. H. Day Co., Cincinnati, Ohio.

Plant Accessories and Supplies

ALLOY STEELS—Fabricating data on nickel alloy steels is given in "The Working of S.A.E. Nickel Alloy Steels", issued by International Nickel Co., 67 Wall St., New York, N. Y.

BEARINGS—Three data sheets dealing with the application of "Ledaloyl" self-lubricating bearings have been issued by Johnson Bronze Co., 507 S. Mills St., New Castle, Pa.

BRAZING METALS—"Sil-Fos" and "Easy Flo" low temperature silver alloys for brazing in the repair and construction of such equipment as heating units, cooling coils, air conditioning units, tanks and production equipment, are described in a recent bulletin of Handy & Harmon, 82 Fulton St., New York, N. Y.

DIESEL ENGINES—The use of diesel engines for supplying power in the bakery, creamery, dairy and meat packing fields form the subject of four-page illustrated bulletin Form 6153 of Caterpillar Tractor Co., Peoria, Ill.

ELECTRIC MOTORS — Split phase motors are described in illustrated Bulletin BCA-120.0 by Century Electric Co., St. Louis, Mo.

FLAVORS AND COLORS — Essential oils, other flavors and colors for food products are among the chemical products listed, with prices, in the recent price list and catalog issued by Magnus, Mabee & Reynard, 16 Desbrosses St., New York City.

FLEXIBLE COUPLINGS—A complete line of flexible couplings of various types for use in power transmission work is described and illustrated in 12-page catalog No. 1845, published by Link-Belt Co., 307 N. Michigan Ave., Chicago, Ill.

LUBRICATION FOR MILK INDUSTRY—A bulletin entitled "Lubriplate Lubricants in the Dairy Industry" containing information on lubrication for dairies, ice cream plants and other branches of the milk products industry has been issued by Fiske Bros. Refining Co., 129 Lockwood St., Newark, N. J.

REFRIGERANTS—The fifth edition of the book entitled "Methyl Chloride," describing the chemical, physical, physiological and refrigerating properties of methyl chloride "Artic" refrigerant has been issued by the R. & H. Chemicals Dept., E. I. duPont de Nemours & Co., Wilmington, Del.

RUBBER PUTTY—"Plastikon" rubber putty, for making air-tight, water-tight and corrosion-resistant seals and caulkings, is described in a recent catalog section issued by The B. F. Goodrich Co., Akron, Ohio.

SCALE AND RUST REMOVAL—A 20-page illustrated booklet on methods for the removal of scale and rust deposits from water-cooled equipment in canning and packing plants, has been issued by Oakite Products, Inc., 26 E. 10th St., New York, N. Y.

SOUR CREAM—How to make sour cream and how to merchandise it are the subjects of a bulletin priced at 50 cents and issued by Mono Service Co., Newark, N. J.

TRUCK REFRIGERATION — Lightweight refrigeration units of the compressor type for use on food trucks form the subject of four-page illustrated bulletin CR-152, of Carrier Corp., Syracuse, N. Y.

WATER TREATMENT—Plants for the hot process softening of water are illustrated and described in a 12-page bulletin issued by the American Water Softener Co., Lehigh Ave. and 4th St., Philadelphia, Pa.

Control Equipment

CONTROL INSTRUMENTS — Bulletin 242, entitled "Instruments for Food Industries", is an illustrated bulletin of recording and indicating controllers, thermometers and gages, for the measurement of temperature, pressure, humidity and flow in food industry plants, issued by the Foxboro Co., Foxboro, Mass.

pH TESTER—An industrial pH tester of portable type is discussed and illustrated in a four-page bulletin issued by Wilkens-Anderson Co., 111 N. Canal St., Chicago, Ill.

TEMPERATURE REGULATORS — Self-operating temperature regulators for controlling flow of steam, gas, water, or brine are described and illustrated, together with capacity tables and application graphs in Catalog 62 of Sarco Co., Inc., 183 Madison Ave., New York, N. Y.

Eye witness

TO THE BEGINNING OF A DISASTER THAT NEVER HAPPENED

HE was a new man on the job, but even he could plainly see that the sudden discoloration in the flow through the "PYREX" Piping in front of him meant trouble. A word to his foreman . . . prompt remedial action and a whole day's production was saved that, but for the transparency of "PYREX" Piping, might have been lost.

You might find such a story anywhere among the case histories of "PYREX" brand Piping. Its transparency makes every worker a pipe line inspector.

Add to that invaluable quality of "PYREX" brand Industrial Glass its other qualities . . . chemical stability*, resistance to thermal shock, smooth hard surface and mechanical strength . . . and you will see why its installation will end most of your pipe line troubles. Write today.

*"PYREX" brand Industrial Glass is remarkably resistant to all acids and alkalies in solution (except concentrated HF).

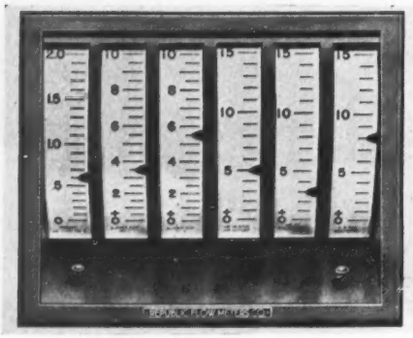
"PYREX" is a registered trade-mark and indicates manufacture by Corning Glass Works.

CORNING
Glass Works
Corning, New York

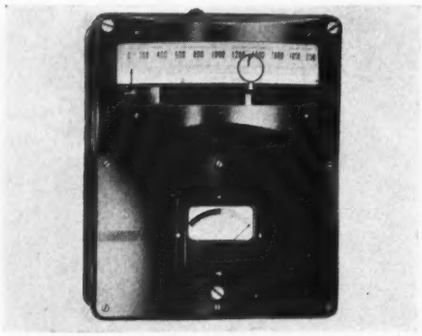
Pyrex Industrial Glass

Food Equipment News

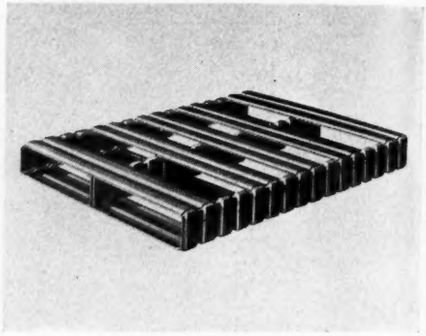
REVIEW OF FOOD PROCESSING EQUIPMENT, ACCESSORIES, AND SUPPLIES



Multi-point indicator



Electronic pyrometer controller



Lightweight steel pallet

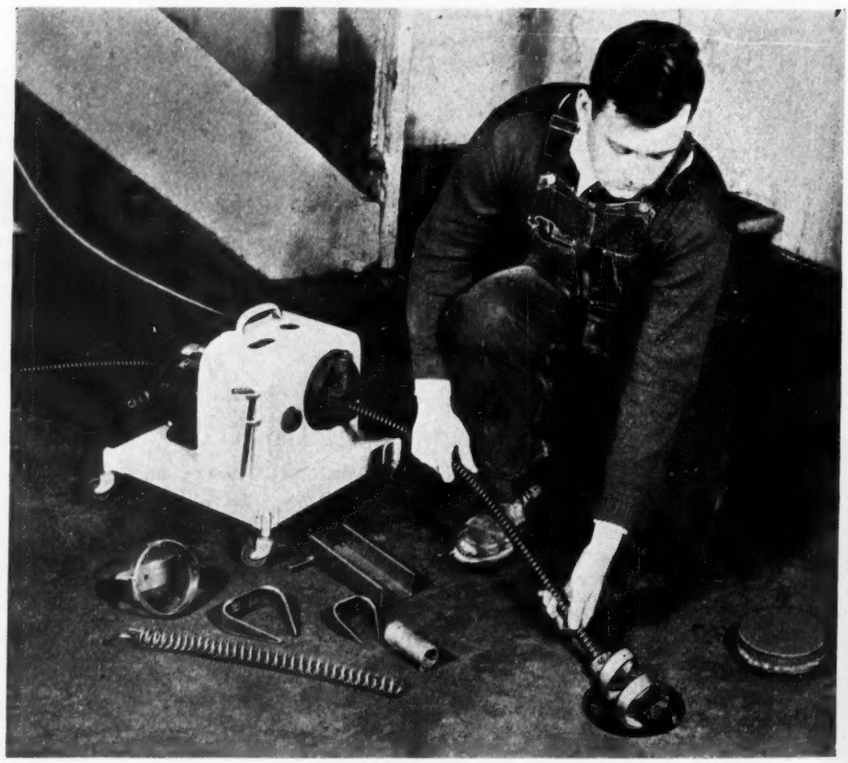
Multi-Point Indicator

Republic Flow Meters Co., 2240 Diversey Parkway, Chicago, has brought out a multi-point indicator for indicating draft pressures, differentials and other factors. With this indicator, zero adjustments and all piping connections for each gage unit are accessible from the front of the panel and each unit is designed to be withdrawn, like a book from a shelf, without disturbing other units.

Each gage is actuated by a sensitive dry-bellows type of diaphragm for ranges from 0 to 50 in. of water, or by a helical element for pressures above 50 in. of water. The gages have 12-in. vertical, translucent, rear illuminated scales. The new indicator is supplied with from 2 to 6 of these interchangeable gage units and is built for either flush or projected mounting.

Electronic Pyrometer Controller

The Bristol Co., Waterbury, Conn., has developed an electronic pyrometer controller which avoids the use of moving parts of any kind in the control circuit. In this instrument, control is accomplished by means of an electronic circuit using a single high-output vacuum tube of the all-metal type. The pointer of the Weston millivoltmeter movement is not engaged or retarded at any point within its normal operating range, thus leaving it free to indicate continuously the temperature of the controller. The measuring unit is equipped with a cold end compensator to insure high accuracy. A milliammeter on the front of the instrument indicates the conditions of the control circuit at all times.



Electric machine for cleaning out pipes and sewers

Pipe Cleaning Machine

Oster Mfg. Co., 2057 E. 61st Place, Cleveland, Ohio, recently developed an electric cleaning machine for pipes and sewers, said to be capable of removing stoppages several hundred feet away from the opening, even when it is necessary for the cleaner head to pass through elbows or traps. The machine is equipped with various types of revolving heads of augur and cutting types. Also various types and thicknesses of coiled wire "snakes" are available. With the proper combination, the makers claim the machine will cut grease, roots, rags or other obstructions.

A ½ hp. Black & Decker universal reversible variable speed motor drives the feeding machine through a V-belt. A split pulley on the motor can be adjusted so as to lighten the tension on the belt, allowing it to slip before the "snakes" become overstrained, in case an extra heavy obstruction is encountered.

Operation is through a gripping chuck revolved by the above motor, which revolves the "snakes" eccentrically. This eccentric action transmits a whip to the tool working at the end of the line, enabling it to do a more thorough job at the full diameter of the pipe. The drive unit, which is 15 x 15 in. and 14 in. in height, weighs 85 lb. It is mounted on casters for easy portability.

Lightweight Steel Pallet

UNION METAL MFG. CO., Canton, Ohio, is making a lightweight steel pallet for use with fork lift trucks in plant materials handling operation. This pallet is 5¼ in. high with a 4 in. clearance between the deck and the bottom. The length and width can be varied to meet requirements. It is furnished in two styles, slatted deck and bottom as shown in the illustration, or with solid deck and bottom.

While the pallet is designed for a normal load of 4,000 lb., it is capable of carrying a much greater load. Strength and rigidity have been built into it by welding the corrugated cross members to the channel members which are shaped to take the corrugations. It is said that this construction permits the use of a light gage steel and prevents weaving while providing the necessary load carrying capacity. The manufacturer claims that maintenance costs are lowered with this pallet, because if a cross member becomes damaged it can be removed, straightened and then replaced.

Container Filler

FOOD MACHINERY CORP., Hoopeston, Ill., has brought out the FMC special filler, an automatic machine for the filling of free flowing products into jars, cans or other containers.

This high speed filler is designed to fill, to a predetermined level, small containers which may have unavoidable variations in capacity and which otherwise might be overfilled or underfilled. It has a control which cuts off the flow at a predetermined level instead of at a given volume, that is, it fills all containers to the same height regardless of variations in capacity. The filling nozzle is so positioned at the center of the jar that each container is filled with a full "crowned" appearance, with adjustment so exact that the jars can be filled to a level extremely close to the rim.

Liquefied Gas Handling System

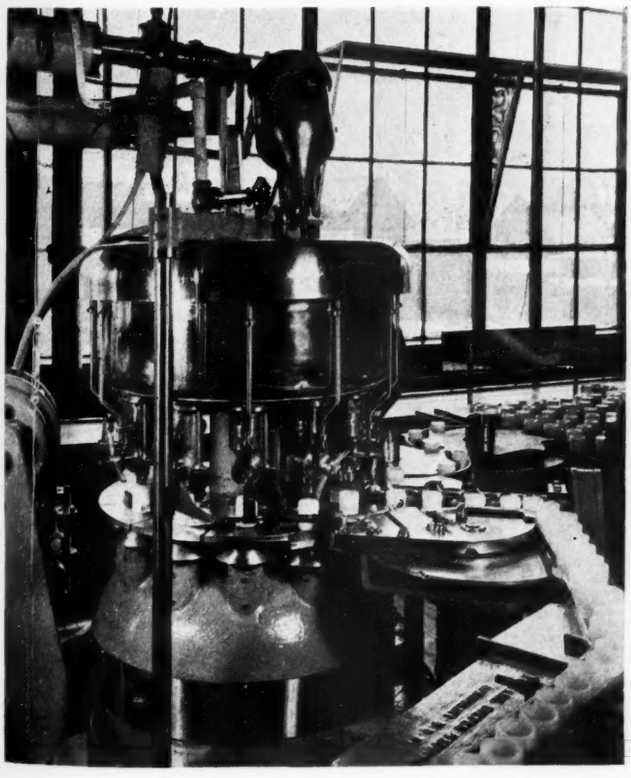
BLAW-KNOX Co., Pittsburgh, Pa., has developed a complete bulk plant for the unloading and storage of liquefied gasses such as ammonia and chlorine. The reason for this development was to effect savings in purchase and handling through the use of tank-car lots rather than through the purchase of these liquefied gases in cylinders. As can be seen from the photograph, this equipment centers around a bulk storage tank. This tank is of special welded construction and is fabricated to comply not only with the A.S.M.E. Code but also with that of the state in which it is used.

In addition to the tank, equipment consists of the requisite piping, properly designed and chosen for the particular gas that is to be handled; and compression equipment, usually of the piston type, suitable for moving the liquefied gas from tank car to tank and to other required points in the plant.

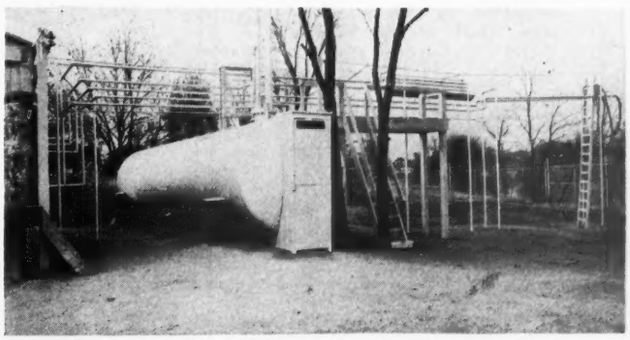
Where the liquefied gas being handled is ammonia, these storage units are usually designed for capacities from 13,000 to 15,000 gal.

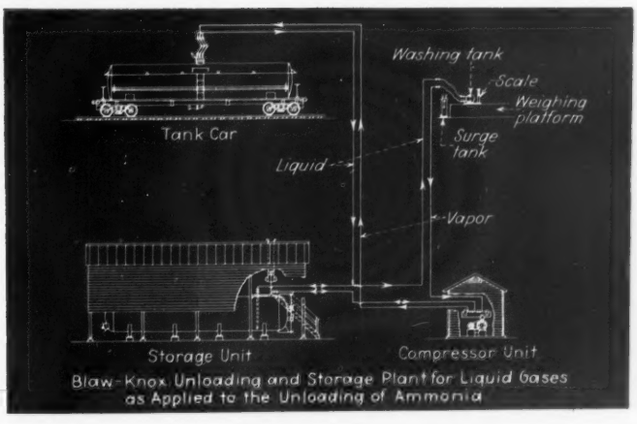
Packaging Machine

TRIANGLE PACKAGE MACHINERY CO., 906 North Spaulding Ave., Chicago, has developed the Junior Elec-Tri-Pak, a new addition to its standard line of Elec-Tri-Pak weighers. This machine



Filler for filling containers to predetermined level



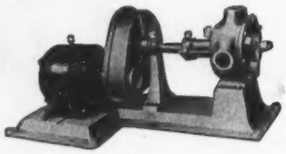


Blaw-Knox Unloading and Storage Plant for Liquid Gases as Applied to the Unloading of Ammonia

Bulk storage system for liquefied gases such as ammonia

Put Your
HEADACHE
in an
ENVELOPE

Viking makes no claim to be a "cure-all"—but headaches caused by constant pumping worries are right down its alley. Many a production manager has secured quick, lasting relief by simply installing dependable Viking Rotary Pumps. With only 2 moving parts, Viking lasts longer, requires less power, is easier to service, demands less servicing. If your pumps have made you a chronic sufferer, we suggest you put your problem in an envelope and mail it to Viking. We'll fire back Bulletin 103-35, which you'll find is a splendid "first aid kit" for a surprising number of pumping worries.



LOOK FOR THIS TRADE MARK THE SIGN OF A GENUINE VIKING

VIKING
PUMP COMPANY
CEDAR FALLS, IOWA

is specifically designed for packaging a widely diversified line of products such as beans, peas, rice, tapioca, barley, nut meats and similar items.

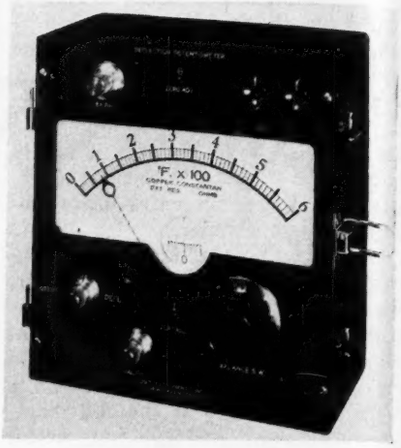
The unit weighs and fills bags, bottles, cartons, cans and envelopes. In it, the feeding is accomplished by electrically vibrating feed plates, which discharge the product to packages. When the package has reached a predetermined weight, the feeding mechanism automatically shuts off by tipping the balance beam of the scale which controls a mercury switch. The package is released from under the spout by the operator and a new package inserted, at which time the feeding action resumes. The machine is supplied with a hopper at the top, holding a considerable quantity of the product that is being packaged.

This Junior machine is a one-operator unit and is provided with a stand and a gummed tape machine for sealing bags.

Portable Pyrometer

J-B-T INSTRUMENTS, INC., 441 Chapel St., New Haven, Conn., has brought out Model 70-PO, a portable potentiometer pyrometer for the measurement of temperatures in industrial plants, laboratories and moving vehicles. This model can also be permanently installed if desired.

Advantages claimed for the pyrometer are that it is designed to withstand vibration and adverse conditions in surrounding atmospheres, that it is unusually light in weight,



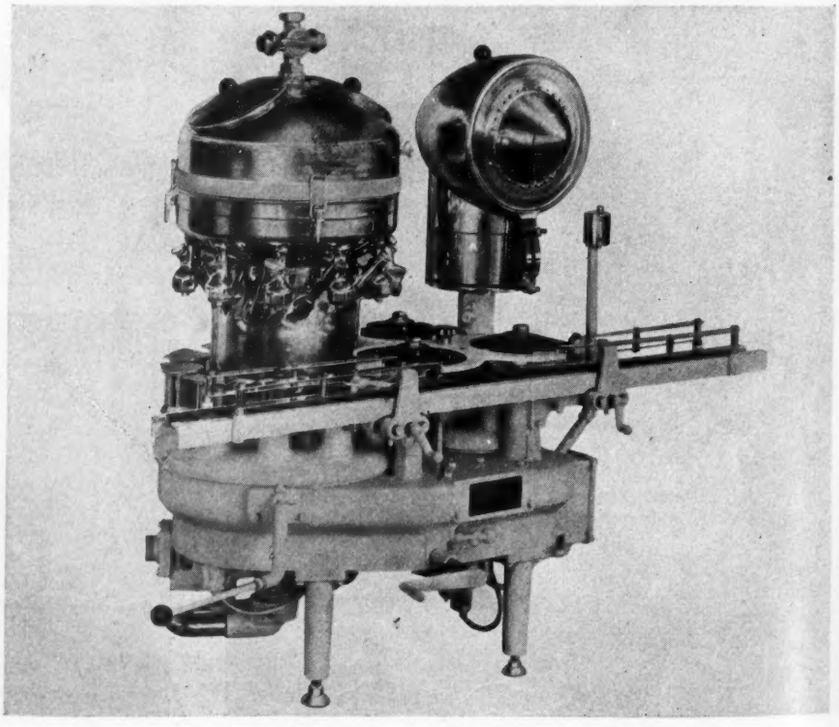
Portable pyrometer useful in measuring temperatures of refrigerated transportation.

and that it requires only a flashlight cell for operation.

Various scales are available with this pyrometer, including a range from —50 to +50 deg. F., suitable for use in connection with refrigerated and frozen foods transportation.

Filler-Crowner

MOJONNIER BROS. CO., 4601 West Ohio St., Chicago, has developed a vacuum filler combined with an automatic crowner in a single synchronized unit for the sanitary bottling of free flowing liquids. The filler will fill any liquid product in bottles from 4 oz. to ½ gal. in size and the crowner



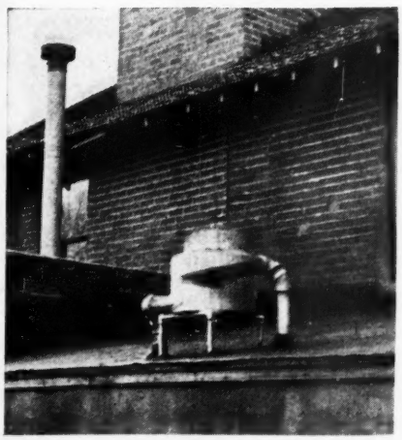
Filling and crowning machine for hot or cold food products

will handle preformed caps of 26 and 36 mm. sizes. The machine is designed for filling at a sterilizing temperature of 190 deg. F., but can be used to fill cold products also.

The construction of this equipment is of stainless steel and is designed for the sanitary handling of such products as fruit juices, soups, ketchup, chili sauce and mayonnaise. Operating on the vacuum principle, this filler has no valves or moving parts in the filling head. The design is arranged to permit changeover from one size of bottle to another in less than five minutes.

Blow-Off Muffler

SULLIVAN VALVE & ENGINEERING Co., 910 S. Arizona St., Butte, Mont., has brought out a new type of blow-off muffler for separating sludge and water, and dissipating pressure from blow-off lines in steam boiler plants.



Blow-off muffler located on roof of plant.

This is a centrifugal device by means of which steam can be vented in the boiler room or outside through a sheet-metal pipe and the water can be released through an open floor drain or direct to a sewer connection.

Its use protects sewer lines from high temperatures which would occur if blow-down was led directly to the sewer. The blow-down on entering the inlet of the muffler is forced into centrifugal motion which separates the sludge and water, permitting the vapor to rise and escape through the vent. The whirling action keeps the muffler clear of sludge and sediment. The outlet of the muffler, being always open, avoids any build-up of dangerous pressures. The installation weighs but 50 lb. and can be located in any desired position.

Floor Sealer

AMERICAN ASPHALT PAINT Co., 43 E. Ohio St., Chicago, has brought out Valdura floor sealer for treating unfinished wood floors to protect them against dirt, water, grease and wear. This sealer is devised to penetrate the wood and seal the grain, so that sealing is accomplished without the use of a surface coating which would wear off. It is claimed that one coat only is needed and that the sealer can be easily applied with a mop or brush, at the rate of one gallon to each 800 sq.ft.

In addition to its use on floors, the makers also recommend this coating for wooden churns.

Sump Pump Float Switch

A FLOAT SWITCH designed for sump pump control is being made by General Electric Co., Schenectady, N. Y. This is a single pole switch employing an overcenter toggle mechanism. The float rod weight is counterbalanced by a calibrated spring acting on the operating lever.

Other features of this switch include corrosion resisting parts in the mechanism which permit operation under severe moisture conditions; ac-

See HTH PRODUCTS*

Slash Spoilage Losses, Guard Purity

1. More and more dairy plants are guarding the quality of their product "from cow to consumer" by placing in the hands of their milk producers a dependable sterilizer like Lo-Bax or HTH-15. Both these products are so low in cost and easy to use that producers can apply effective bactericidal treatment freely to milking machines, surface coolers, pails, cans, strainers, etc.

2. Distilleries have found HTH Products valuable in disinfecting fermenting vats and other equipment; wineries use these dependable sterilizers in keeping tanks sweet and in general deodorizing and disinfecting around the plant. Just as in other branches of the food industries, HTH Products do an effective job of bacteria control — quickly, economically.

3. A safe water supply is vital to most food plants and is often a problem for those having to depend on wells or other water sources of their own. HTH Products contain available chlorine in convenient dry form and may often be the answer to water treating problems of this sort just as for the destruction of algae in condenser water, the disinfection of cooling water in canneries, etc.

● In beverage plants and food plants alike, that silent thief, bacterial contamination, may cause serious financial loss unless effective means are found to keep this menace in check.

HTH Products have proved their efficiency as practical, dependable germ-killers in hundreds of food and beverage plants.

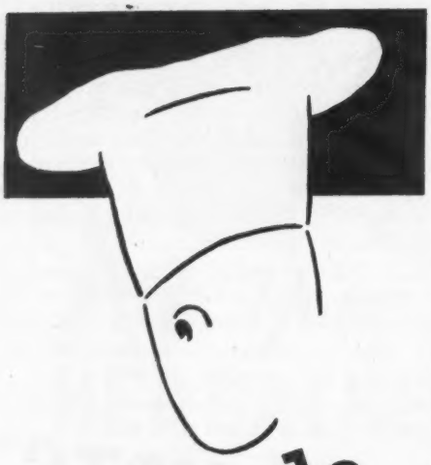
HTH Products are chlorine sterilizers in powder form—convenient to use, always full strength. Their action is quick and dependably effective. You just add them to water — they make germicidal hypochlorite solutions of the strengths needed to flush or spray any surfaces with which your food or beverage products come in contact. HTH Products are so economical you can use them freely throughout the plant.

Write today for complete information on HTH Products and their easy, effective use.

HTH PRODUCTS

THE MATHIESON ALKALI WORKS (INC.) 60 EAST 42ND STREET, NEW YORK, N. Y.

* HTH PRODUCTS (HTH, HTH-15 and LO-BAX) . . . DRY ICE . . . CARBONIC GAS . . . AMMONIA, ANHYDROUS and AQUA . . . CAUSTIC SODA . . . SODA ASH . . . BICARBONATE OF SODA . . . LIQUID CHLORINE . . . BLEACHING POWDER . . . PH-PLUS (FUSED ALKALI) . . . SYNTHETIC SALT CAKE



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cessible terminals for easy wiring; a dummy terminal to provide convenient wiring of the through side of the line; fine-silver contact tips; and snap-action mechanism. The makers state that this control simplifies the design of the sump pump, because of the fact that it is actually built for mounting in the motor end-shield or on some suitable part of the pump.

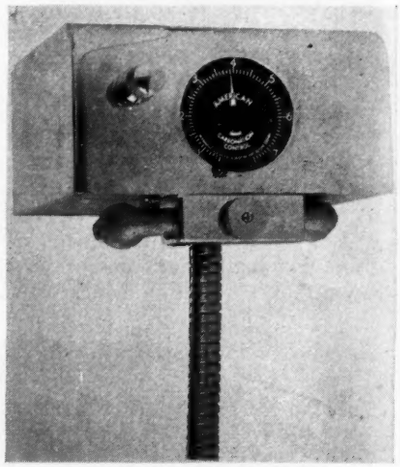
Grinding Mill

ABBE ENGINEERING Co., 50 Church St., New York City, has brought out a new grinding mill of the pebble or ball type for wet grinding, incorporating certain features designed to increase its utility in the food and allied industries. This mill, which may be built in any desired size, is of welded construction throughout and is either unlined or is lined with porcelain or buhrstone blocks. It is jacketed for heating with steam or hot water, or for cooling with cold water or brine. The heating or cooling medium inlets and outlets are through combination stuffing boxes at both ends of the mill. These stuffing boxes also permit the feeding of liquids and gases to the mixing or grinding chamber for the processing treatment that may be required. Conversely, gases or vapors produced during the processing may be evacuated from the mill and caused to flow into a condenser and vacuum pump. Both of these stuffing boxes are provided with sight glasses.

Advantage claimed for this mill is that it is applicable to a number of products that may be ground, mixed, or otherwise processed in wet or damp state under any temperature or pressure and dried in one operation. In many cases, this combination of processing will eliminate the necessity for preliminary mixing and the possible use of evaporators, grinders or dryers in order to produce the product in its final state.

Carbonation Controller

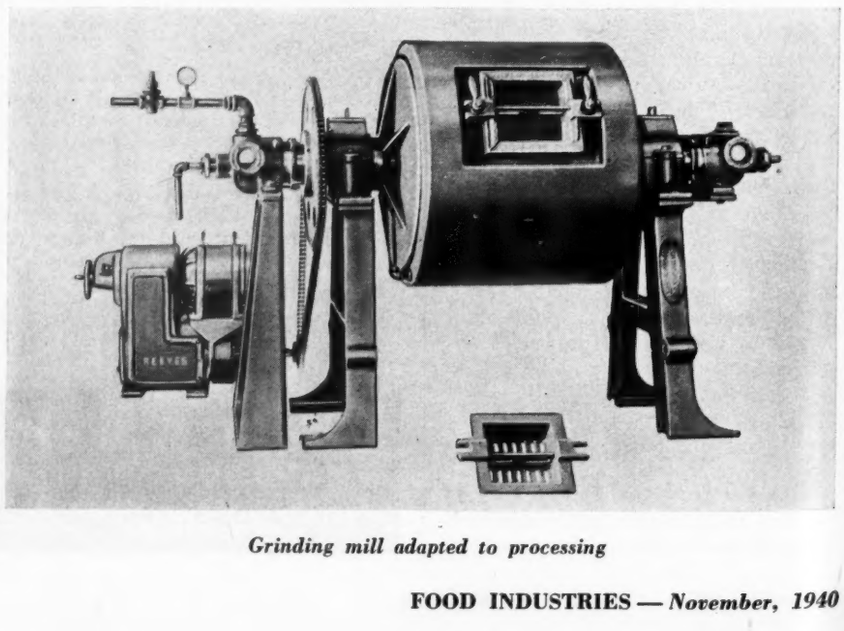
AMERICAN Schaeffer & Budenberg Instrument Div., Manning, Maxwell & Moore, Inc., Bridgeport, Conn., has developed a carbonation controller for use by the bottlers of carbonated beverages. The purpose of this control-



Carbonation controller for use by bottlers of carbonated beverages.

ler is to give uniform gas volume to the carbonator automatically, regardless of changes in water temperature or pressure in gas cylinders. It maintains the gas pressure in the carbonator within close limits, automatically increasing or decreasing this pressure with changes in water temperature. By this means, a constant gas volume is maintained in the outlet water to the filler.

Setting the instrument for various gas volumes is done by turning the knob on the front of the case and



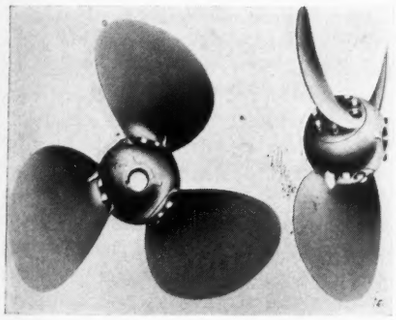
Grinding mill adapted to processing

making a setting as desired as indicated by the dial. With plants which bottle only one product, it is unnecessary to alter the control setting once the proper gas volume has been obtained. Plants that bottle a variety of products develop a setting for each product. Once the setting is made, the controller will always deliver the desired carbonation.

Agitation Propeller

BASED on principles developed in the manufacture of marine propellers, Federal-Mogul Corporation, Detroit, Mich., has developed three-blade impellers of cast Ni-Resist for use in the agitation of salt evaporators. These propellers are each 45 in. in diameter and weigh 365 lb. assembled. Blades are detachable, permitting adjustment to any pitch between 34 and 40 in., for efficient operation. These blades are attached by Monel metal studs and elastic stop nuts. This construction permits convenient installation of the impellers as the four small units, the hub and the three blades, can be installed without enlarging the manholes of the evaporators.

While the impeller described above



Corrosion resisting agitation impeller

was made for use in the Diamond Crystal Salt Division of General Foods Corp., the general design is said by the manufacturer to offer a practical solution of many problems involved in the agitation, mixing and circulation of corrosive ingredients.

Truck Refrigeration

FRIGIDAIRE DIV., GENERAL MOTORS SALES CORP., Dayton, Ohio, has brought out a small condensing unit for use with refrigerated trucks. This is a ½ hp. unit designed for equipping small refrigerated bodies such as are used by distributors of frozen foods and for similar refrigerated distribution purposes.

The new unit is built to occupy little space and is mounted on a base constructed of welded channel and angle iron sections. It is equipped with a two-cylinder slow-speed reciprocating compressor.

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Food Technology

NEW DISCOVERIES & INVENTIONS

FOOD ENGINEERING

How to Avoid External Corrosion of Tin Cans

TWO TYPES of attack tend to produce unattractive packages under corrosive conditions—either the steel base plate is attacked or the tin film is affected. Poor storage conditions are conducive to rust formation on empty cans. Can covers should never be stacked in the humid air of the canning room nor near the closing machine where they are subjected to water spillage or the dripping of brine or acid products.

"Etching" by alkaline detergents used in rinsing greasy products and the accumulation of residues on acid products are prevented by thorough rinsing.

Sodium chromate in the water in retorts reduces the harmful effects of corrosive waters or condensates during processing. One tablespoon of the dry material is used per kettle for a 4-hour run; then the kettles are drained to avoid accumulation of the corrosive material in the bath.

Unless retort crates are lined with wooden slats, the tin plating may be removed by electrolysis set up when the cans touch the metal crates. Proper venting of the retorts during processing and the coming-up period prevents pitting and rusting caused by air pockets or oxidation of the tin plate. Lining of crate bottoms with sheet aluminum with holes to coincide with the perforations in the bottom (to permit steam circulation) eliminates both staining and abrasion from contact with rust-covered iron crate bottoms.

The effect of corrosive cooling waters, especially when they contain appreciable quantities of chlorides and sulphates, is minimized by adding sodium chromate to the water at the rate of about 1 lb. per 1,000 gal., the exact amount varying with the composition of the water. This treatment is effective in alkaline, neutral and slightly acid waters by forming an insoluble, protective film coating on the exposed surfaces.

Excessive chlorination and exposure to high temperatures over a period of time accentuate corrosion during cooling. Draining by tilting the crates reduces the formation of residues on the cans, a frequent cause of pitting.

In the warehouse, corrosion may be due to more diversified causes than at any other point of production, the most common being (1) rust from casing too cold and too wet, (2) pitting by hydroscopic residual water salts, (3) sweating and (4) bursted cans.

Digest from "Control of External Corrosion of Cans," by C. L. Smith, 1940 National Canners Association Convention.

FOOD TECHNOLOGY

Vinegar an Enemy to Molds

VINEGAR is definitely a preservative against food spoilage by microorganisms, undoubtedly because acetic acid is toxic to the organisms. Since vinegar is commonly accompanied by sugar or salt, or both, in food products, a study was made of the toxicity of acetic acid to microorganisms.

The typical food-spoilage organisms selected for tests were *Staphylococcus aureus, Phytomonas phaseoli, Bacillus cereus, Saccharomyces cereviseae* and *Aspergillus niger.* Tests were made in water, 5 percent brine and 20 percent sugar sirup, with varying acetic acid concentrations. The tests showed that acidity (pH) is not the only property by which acetic acid is toxic to molds and other organisms. Salt brine and sugar sirup give some help to acetic acid as an inhibitor of mold growth but mainly only through changing pH and not by any direct effect. Acetic acid inhibited bacterial growth almost in direct proportion of its concentration. When a 5 percent salt brine was added to a solution containing 0.1 to 0.17 percent acetic acid, the salt contributed nothing toward inhibiting the growth of Aspergillus. Under some conditions, sugar sirup actually promoted the growth of microorganisms at such low, nontoxic acetic acid concentrations.

At higher acetic acid concentrations (up to 4.73 percent total acidity) the yeast (Saccharomyces) was more resistant than the mold (Aspergillus), but the bacteria were still more resistant. *Phytomonas phaseoli* was most resistant to acetic acid; *Bacillus cereus,* least resistant. This was true both in the presence and absence of salt brine or sugar sirup.

Digest from "Inhibiting Effect of Acetic Acid Upon Microorganisms In the Presence of Sodium Chloride and Sucrose," by A. S. Levine and C. R. Fellers, *Journal of Bacteriology* 40, 255, 1940.

DAIRY PRODUCTS

Knowing the Why of Quality

IN THE ANNUAL competition for the judging of dairy products, the students are asked to give a numerical value for each desirable quality and also to state in what way the sample lacks perfection. In the 1938 contest, 69 students scored seven samples each of milk, butter, cheese and ice cream, 483 samples in all. Statistical analysis applied to their scores and their criticisms shows that a man who scores well does not necessarily criticize well. On the other hand a man who knows what is wrong with the product can usually give it an accurate grade.

Digest from "Correlation between Grades on Scores and Grades on Criticisms in the Judging of Dairy Product," by William White, P. A. Downs, M. J. Mack, J. L. Fouts and G. M. Trout, *Journal of Dairy Science,* 23, 1, 1940.

Bacteriology of Ice Cream

THE BURRI smear culture technic, much used for investigating numbers and distribution of bacteria in milk and butter, has been successfully adapted to bacterial examination of ice cream. Small portions are picked (not scraped) from well-frozen ice cream with a sterile platinum needle under a low power binocular. Each specimen is spread over a dry agar slope. The medium and culture conditions are the same as for milk.

The method was applied to packaged and dipped ice cream to ascertain sources of contamination and the relative bacterial count of interior and surface layers. Bacterial counts by this method are not in close agreement with plate counts. Generally

the Burri count is higher than the plate count, but sometimes it is lower. Plate counts are not numerically accurate as to numbers of individual organisms, so the differences are not surprising.

The main advantage of the Burri technic for ice cream is that it gives useful information concerning distribution of bacteria. This is particularly important in tracing contamination caused by use of unsanitary dippers. The method is also useful for tracing causes of contamination in package ice cream.

Digest from "Burri Technique for Examination of Ice Cream," by H. F. Long and B. W. Hammer, *Iowa State College Journal of Science* 14, 163, 1940.

Cheese Package

A NOVEL cheese wrapping system is described in Canadian Patent 388,398 (granted April 30, 1940, to Clinton H. Parson of Chicago and assigned to Industrial Patents Corp., Chicago). The cheese is first firmly wrapped in a cheese bandage, which is then coated with paraffin. An outer open-mesh bandage is then applied, and well coated with wax so that the wax is embedded in the open meshes of the outer bandage.

The new system is particularly applicable to the final packaging of cheese after the aging process.

Pasteurizing Processes And Flavor of Milk

MILK is not generally considered a good source of ascorbic acid (vitamin C) as this vitamin is readily oxidized. Milk, either raw or pasteurized at the usual 145 deg. F. with 30 minutes hold, rapidly decreases in vitamin C content. If traces of copper are present the vitamin C practically vanishes in four days, and a marked oxidized flavor develops. However, if the milk is pasteurized at 167 deg. for 30 minutes, there is far less loss of vitamin C and no oxidized flavor even with copper added, at least up to three days storage. Flash pasteurization between 140 and 167 deg. did not stabilize the vitamin, but between 185 and 206 deg. did protect it markedly up to four or five days storage.

Pasteurization with a ten minute hold at various temperatures between 149 and 194 deg. shows a marked dividing line at about 176 deg. At and above this temperature oxidized flavor does not develop, and the vitamin C content is better preserved, especially if added copper is added to the milk after rather than before pasteurization. (These results may be interesting in the working out of a high-temperature, short-time pasteurization, and also

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Digest from "Ascorbic Acid and Oxidized Flavor in Milk, II. The Effect of Various Heat Treatments of Milk upon the Stability of Ascorbic Acid and upon the Development of the Oxidized Flavor," E. C. Gjessing and G. M. Trout, *Journal of Dairy Science* 23, 373, 1940.

FATS & OILS

Grapefruit-Seed Oil

IN THEORY, the potential annual yield of oil from the available grapefruit-seed supply in Florida is nearly 2,000 tons. Commercial production has only begun, with an output of 45 tons in the 1938-39 season.

Wet seeds from the canneries, potentially available to the extent of about 15,000 tons annually, are deslimed by fermentation for a day or two in water containing a little tricalcium phosphate. The drained seeds are steamed to crack the hulls, then dried to 2.5 or 3 percent moisture content and pressed. The pressed oil is filtered. The press cake is sold for fertilizer, or returned to the canneries for admixture with dehydrated cannery wastes and sold as cattle feed.

The efficiency of expressing oil from grapefruit seed is questionable since the press cake contains from 8 to 19 percent oil. Solvent extraction may prove to be more effective.

The crude expressed oil is intensely bitter but has a pleasant nutlike aroma. Bitterness is removed by treatment with sodium hydroxide, leaving a bland flavor. The reddish-brown color is bleached to a pale straw color by active carbon and a filter aid. "Wintering" at 33.8 deg. F. and expressing from the stearin precipitate gave a pale yellow oil. The bitter principle is apparently limonin. It was isolated from the soap stock produced by refining the crude reddish-brown oil.

Digest from "Grapefruit Seed Oil," by A. J. Nolte and H. W. von Loesecke, *Industrial and Engineering Chemistry* 32, 1244, 1940.

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FRUIT & VEGETABLE PRODUCTS

Chinese Celery Cabbage For Calcium

CELERY CABBAGE is rich in calcium, has a high proportion of available carbohydrate, contains high ranking food proteins and is a good source of vitamin C. Feeding tests with animals on a low calcium diet indicate that calcium intake can be doubled by giving celery cabbage. More important still, this vegetable improved calcium retention in the bodies of the test animals.

The total carbohydrates in celery cabbage include cellulose, lignin, pentosans, dextrine, starch and sugars. At least one-fourth of the total carbohydrate, probably more, is directly assimilable. About two-fifths of the dry matter in celery cabbage is carbohydrate, and of this total a large proportion is crude fiber, useful in the diet as bulk or roughage.

Since the fresh vegetable contains about 95 percent water, it is a bulky food, not readily eaten in sufficient quantity for most effective utilization of its important dietary factors. For this reason dried celery cabbage is suggested, especially among populations where dietary deficiencies are common.

Digest from "Chinese Celery Cabbage as a Supplement to a Cereal Diet," by P. C. Hsu and W. H. Adolph; and "Chinese Celery Cabbage: Carbohydrate," by P. C. Chang and W. H. Adolph, *Chinese Journal of Physiology* 15, 275, 285, 1940 (Published in China).

Preparation of Papain

THE LATEX from green papayas contains papain, an enzyme which assists in the hydrolysis of proteins. Its activity may be measured either by

observing its potency in clotting milk or by measuring the rate at which the enzyme digests casein. The enzyme can be activated by a reducing agent such as cysteine: hydrochloric acid.

The Hawaiian Agricultural Experiment Station, in collaboration with the Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture, has made a study of papaya extraction to ascertain whether or not the enzyme can be profitably extracted by mechanical methods. The results indicate that the maceration and extraction of picked fruit offers no prospect of profit, but that all parts of the plant except the roots contain papain which can be obtained by refining press juice from the plant. The refined product, as obtained in this study, needs further improvement and it is not certain that the extraction would be profitable, but it has been demonstrated that extraction of papain from the whole papaya plant is entirely feasible. Even the otherwise useless male trees would yield papain.

Green papayas contain papain in their latex, but they also contain a substance which destroys the enzyme or inhibits its activity. Leaves and stems contain less of this enzyme inhibitor, so that their latex is easier to refine than latex from the green fruit.

Digest from "Crude Papain: Preparation and Properties," by A. K. Balls, R. R. Thompson and W. W. Jones. *Industrial and Engineering Chemistry* **32**, 1144, 1940.

GRAIN PRODUCTS

Hydrogen Peroxide Steeps Improve Germinating Capacity In Malting Barley

THE GERMINATING capacity of malting barley can be improved appreciably, resulting in a possible reduction of 1 to 2 days in the germinating period, by adding 0.5 percent of hydrogen peroxide to the last steep water, permitting it to react for at least six hours. Immature barleys, and barleys with high moisture content and low germinating capacity, respond especially favorably to this treatment, the increase depending upon the maturity of the grain. The improvement is similar to that which is attained by drying.

The steep water is very light yellow and cannot be re-used. Aeration has no further effect in the hydrogen peroxide steep. Above 20 deg. C. growth is retarded due to excessive liberation of the oxygen.

Additions of 0.1 percent lactic acid or pre-steeps with lactic acid or sodium hydroxide permit a reduction in the hydrogen peroxide concentration to 0.1 percent without losing any of the effect achieved with the 0.5 percent solution. The coating of the steep tanks must be perfect in order to prevent corrosion.

Digest from "About the Use of Hydrogen Peroxide in Steep Water," by C. Enders, G. Nowak, F. Schneebauer and A. Pfahler. *Wochenschrift für Brauerei* **57**, 81, 1940 (Published in Germany).

SOYBEAN PRODUCTS

Soybean Flour

SOYBEAN FLOUR is becoming widely available on the market. Its approximate composition is 40 percent protein, 20 percent oil, 24 percent nitrogen-free extract, 2.5 percent phosphatides, 1.5 percent fiber, 4.5 percent ash and 8 percent moisture.

The processing and milling of soybean flour has two objectives: The elimination of the bitter and beany flavors and the stabilization of the finished product against deterioration.

The initial step is steam distillation on whole beans to drive out the volatile components responsible for the beany flavor. This steam processing also inactivates the enzyme of the beans, thus enhancing the keeping quality of

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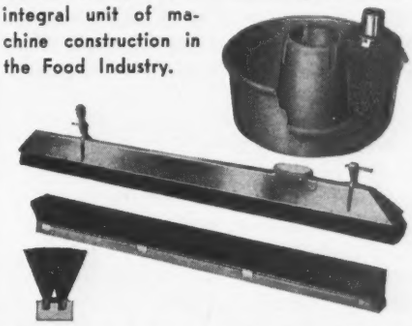

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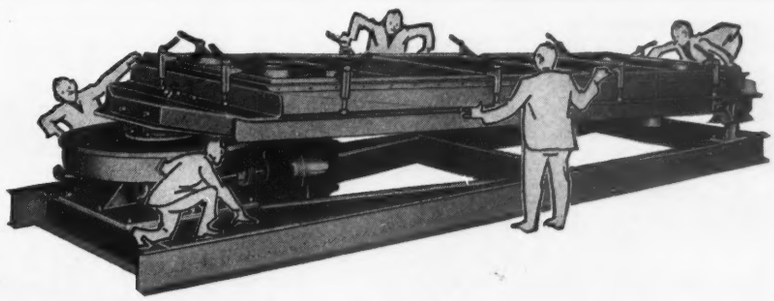

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the whole soya flour. The steam treatment does not, however, remove the bitter substances which are located mainly in the germ and the coat of the bean.

Removal of the germ contributes to stabilization of the flavor by removing the highly unsaturated fatty acids said to be concentrated in the germ. It is interesting to note that the germ of the soybean has a lower oil content than the cotyledon. In wheat, on the other hand, the germ is the part which is the richest in oil.

After thus processing, the beans are milled and bolted with a number of modifications from wheat flour milling practice. A modern continuous processing and milling unit for whole soya flour of 10 tons capacity per 24 hours is available today for approximately $25,000. The total manufacturing expense or conversion cost amounts to approximately $1.08 per barrel.

Although known as whole soya flour, the high protein and fat contents make it quite different from other flours in basic composition. Its emulsifying properties, its vitamin B content and its high oil content adapt it for many specialized uses. It also contributes to the iron and copper requirements of the human diet.

Uses recommended for soya flour include particularly the improvement of ordinary white bread texture, brightness of crust and keeping quality. Sausage manufacturers have accepted it as a binder, and its use is also recommended in special dietary food products.

Digest of "Soya Not a Competitor of Wheat Flour," by A.A. Horvath, Director of Research, Horvath Laboratories, Inc., Chambersburg, Pa., June, 1940, Bulletin, Association of Operative Millers.

STARCH

Sound Disintegrates Starch Pastes

WHEN a potato starch or wheat starch paste is exposed to high-frequency sound vibrations (about the audible range), the specific grain volume is decreased about as much as when the paste is heated to 300 deg. F. Temperature makes little difference in the effect within the range from 60 to 140 deg. F., but air pressure has a large influence. The maximum disintegration effect occurs at about 1 atmosphere (14.7 lb.) pressure. At starch concentrations up to about 5 percent, the effect of ultrasonic vibrations decreases with rising concentration.

A study of this peculiar effect gives evidence that chemical changes (hydrolysis and oxidation) may cause some slight degradation of the starch in this treatment but that the main effect is purely physical. Pulsation of minute bubbles in the paste, due to cavitation, is considered to be the immediate cause of disintegration.

Digest from "Disintegration of Starch Paste by Irradiation With Ultrasonic Waves," by Sozaburo Ono, *Review of Physical Chemistry* (Japan) **14**, 25, 1940 (Published in Japan).

MISCELLANEOUS

Faster Gluconic Acid Production

PRODUCTION of gluconic acid and calcium gluconate from glucose by means of mold fermentation has been slow and tedious because free gluconic acid injures the organism and precipitation of calcium gluconate inhibits fermentation. These difficulties prevented efficient use of concentrated glucose solutions. If gluconic acid could be neutralized without precipitating calcium gluconate, the fermentation could be carried out in concentrated solutions.

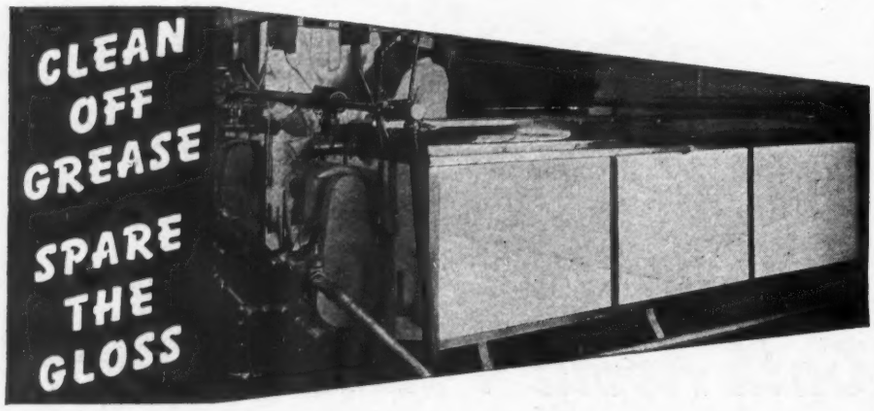
Experiments revealed the merits of boric acid and borax as agents for holding calcium gluconate in solution. Using molds which tolerate boric acid or borax, it is now possible to ferment glucose solutions as strong as 25 percent. By a semicontinuous method in which the mycelium is reused, a batch can be fermented every 24 hours. *Aspergillus niger* is sufficiently tolerant to boric acid or borax and can be successfully used as the fermenting organism.

Digest from "Fermentation of Concentrated Solutions of Glucose to Gluconic Acid," by A. J. Moyer, E. J. Umberger and J. J. Stubbs. *Industrial and Engineering Chemistry* **32**, 1379, 1940.

Glycerol from Molasses

GLYCEROL remaining in dilute (10 to 15 percent) solution in residues from fermenting molasses can be recovered by extraction with butanol. As the recovery method is disclosed in French Patent 843,074 (filed June 26, 1939, by National Maize Products, Ltd., London, England), residues from molasses fermenters are extracted either with butanol or with amyl alcohol, the solvent (now containing glycerol) is separated from the aqueous layer, and the glycerol is separated from the solvent.

Two alternative methods are suggested for separating glycerol from the solvent. One is by distillation, while the other employs a saturated brine as a tertiary solvent.



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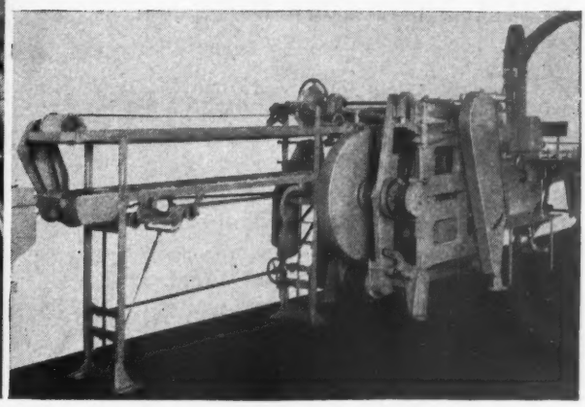

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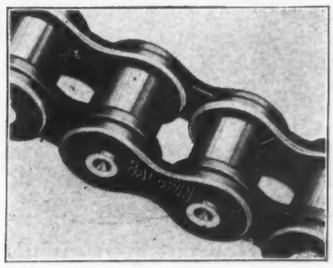

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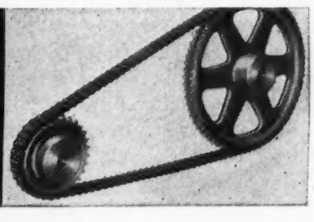

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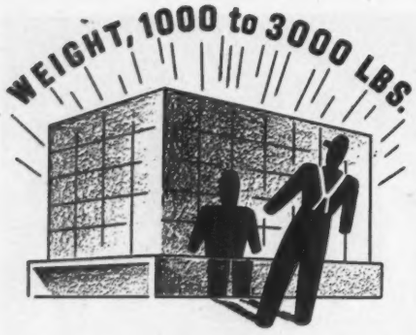

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Books

Tea and Coffee Guide

UKERS' INTERNATIONAL TEA & COFFEE BUYERS' GUIDE. Published by Tea and Coffee Trade Journal Co., 79 Wall St., New York, N. Y. 224 pages; 5x7½ in.; paper. Price, $2.

Now in its tenth edition, this little book is packed with useful information for those engaged in—or competing with—the tea and coffee industries. In addition to facts about the products and their production and consumption, the book contains these classified lists: U. S. tea and coffee packers; delivery route tea and coffee dealers; tea importers; green coffee merchants; tea, coffee and spice brokers; spice importers and packers; chain grocery firms; equipment and supply houses; and tea and coffee exporters in producing countries.

Formulas for Cookies

"PRACTO-FAX" COOKIES. Including Crackers, Biscuits, Flour-confections and Small Cakes. Published by the Nulomoline Co., 120 Wall St., New York, N. Y., 1940. 96 pages; 5½x8½ in.; paper. Free.

There are 54 pages of commercial formulas and how-to-make-them instructions in this book, plus a 26-page section on developing and using formulas for cookie products. The formulas are those developed in the Nulomoline testing bakery for all kinds and varieties made on all machines—sheeter, bar press, wire cut and rotary—and by hand. The pages devoted to developing formulas cover everything from lean crackers to rich cookies and cup cakes. Sixty-two pictures show the finished cookies and machines used in making them.

This book was prepared for users of Nulomoline and it, of course, includes that product in the formulas.

Composition of Foods

THE CHEMICAL COMPOSITION OF FOODS. By R. A. McCance and E. M. Widdowson. Published by Chemical Publishing Co., 148 Lafayette St., New York, N. Y., 1940. 150 pages; 5½x8¾ in.; cloth. Price, $2.50.

Data on the composition of 541 food items commonly eaten in Great Britain are given. A system of analysis was evolved to determine all the important organic and mineral constituents of foods, with the exception of vitamins. And not only were the foods analyzed in the raw state, but also as prepared for the table. The availability of the constituents for human assimilation was taken into consideration. This book was prepared as an aid in the nutritional and dietetic treatment of disease and to further research on nutrition.

Of interest to some will be 43 recipes given in the explanation of how the tables were constructed.

All About Sugar Industry

MANUAL OF SUGAR COMPANIES, 1940. Published by Farr & Co., 90 Wall St., New York, N. Y. 204 pages; 5½x8 in.; paper. Price, $1; cloth edition, $1.75.

Statistics on sugar companies, sugar production and prices, sugar agreements and quotas, together with a wealth of miscellaneous information pertaining to the sugar industries of the world, are packed between the covers of this little book. This edition, which is the 18th, contains new information in the nature of an outline of the sugar industry in the British West Indies and also a calendar indicating the time of issuance of sugar companies' annual reports.

Silver in Processing

SILVER IN INDUSTRY. Edited by Lawrence Addicks. Published by Reinhold Publishing Corp., 330 W. 42nd St., New York, N. Y. 1940. 636 pages; 6¼x9¼ in.; cloth. Price, $10.

Two chapters in this book are of particular interest to food technologists. One is on the oligodynamic effect of silver and the other on silver as a fungicide. The first is written by A. Goetz, R. L. Tracy and F. S. Harris, Jr. The second, by L. W. Nielson and L. M. Massey. The treatment is scientific.

Monthly Recipe Digest

THE COOK'S DIGEST. Published monthly by Coulter Publishing Co., 280 Broadway, New York, N. Y. 5x6¾ in. Price 10 cents a copy.

This is a new periodical for homemakers, and the November issue is the first. That issue contains 70 recipes from food manufacturers, a chart of vitamin sources and a dinner menu planning chart. The recipes are arrange for convenient filing and indexing.

Home economists and dietitians in the food industry may find this new digest of interest.

Patents

Draught Beer Freed From Sediment by Passage Through Settling Chamber in Cooling Line—Fred C. Bristol to Herman M. Gumbin, Chicago, Ill. No. 2,210,164. Aug. 6, 1940.

Chewing Gum Packaged in Accordion-like Carrier so That the Individual Sticks Have a Superposed Order to Each Other and Yet Permit Each Stick to be Removed Without Disturbing Remaining Sticks in Package—Charles C. Baldwin, St. Louis, Mo. Nos. 2,210,194, 2,210,195, and 2,210,196. Aug. 6, 1940.

Ice Cream Made in a Continuous Freezer—Joseph H. Godfrey, Elmhurst, and Arthur W. Farrall, Wilmette, Ill., to The Creamery Package Mfg. Co., Chicago, Ill. No. 2,210,366. Aug. 6, 1940.

Poultry Killed and Bled During Passage Through Electrocuting and Throat-cutting Machine—Paul Onorato, San Mateo and Emile Weinaug, San Francisco, Calif., Weinaug to Barker Poultry Equipment Co., Ottumwa, Iowa. Nos. 2,210,376 and 2,210,377. Aug. 6, 1940.

Sugar Crystallized From Super-saturated Sirup by Subjection to Vacuum Without Caramel Formation and With Recirculation of Liberated Vapor To Multiple Effect Evaporator—Alfred M. Thomsen, San Francisco, Calif. No. 2,210,514. Aug. 6, 1940.

Animal and Vegetable Oils and Fats Purified and Refined For the Removal of Colloidal Aluminum, Magnesium, Calcium and Iron Content—Jakob L. Jakobsen, Minneapolis, Minn. to General Mills, Inc. No. 2,210,548. Aug. 6, 1940.

Liquids Clarified by Passing Through Vertical Filter Connected up With a Mixing Chamber and a Pump so That Filtrate Can be Drawn Off Either Into a Discharge Line or Diverted to Mixing Chamber—Squire C. Hodges, San Francisco, Calif., to S. F. Bowser & Co., Inc., Fort Wayne, Ind. No. 2,210,719. Aug. 6, 1940.

Coffee Bean Given a Dry Coating Containing Small Quantity of Iodine as Preservative Until Roasted—Charles Reynolds, Kansas City, Mo. No. 2,210,819. Aug. 6, 1940.

Fudge Given Non-sticky, Fine-grain Properties Through Inclusion of an Uncooked Blend of Dry Fine Particles of a Solidified Starch Conversion Sirup Containing From 15 to 65 Percent Maltose and Dextrose With Remainder of Solids as Dextrines—Arthur P. Hellwig, Hartsdale, and Emil G. Fisher, New York, N. Y., to American Maize-Products Co. No. 2,210,856. Aug. 6, 1940.

Cake Having Relatively Large Volume and Long Keeping Qualities Prepared By Using a Dry Solidified Starch Conversion Sirup Composed Essentially of 15 to 65 Percent of Dextrose and Maltose With Dextrines as Remainder of Sirup Solids as an Ingredient—Robert L. Lloyd, Laurelton, N. Y., to American Maize-Products Co. No. 2,210,857. Aug. 6, 1940.

Pretzels Twisted by Mechanical Means—Horace E. Farmer, Grosse Pointe Farms, Mich. No. 2,210,864. Aug. 6, 1940.

Vitamin D Content of Fish Oil Separated by Distillation Under Pressures of Less Than Approximately 0.1 Mm. and Between Temperatures of 180 to 260 Deg. C. During a Period of Less Than 2 Minutes—Kenneth C. D. Hickman to Distillation Products, Inc., Rochester, N. Y. No. 2,210,926. Aug. 13, 1940.

Fat Soluble Vitamin Recovered From Vegetable and Animal Oils Without Appreciable Thermal Decomposition by Heating Thin Film of Oil to Distilling Temperatures Under Pressures of Less Than 0.1 Mm. for a Period of About 1 Minute—Kenneth C. D. Hickman, to Distillation Products, Inc., Rochester, N. Y. No. 2,210,927. Aug. 13, 1940.

Centrifugal High-vacuum Distillation Utilized for Recovering Fat-soluble Vitamins From Vegetable and Animal Oils—Kenneth C. D. Hickman to Distillation Products, Inc., Rochester, N. Y. No. 2,210,928. Aug. 13, 1940.

Elevated Hoppers Discharging Dry Powdery Material Into a Closed Receptacle Equipped With a Venturi Tube Designed to Vent Upward Into the Hopper the Air Displaced During Filling of Receptacle—Walter F. Dehuff, Glen Rock, Pa., to American Machine & Foundry Co., Brooklyn, N. Y. No. 2,211,-103. Aug. 13, 1940.

Lollipop Confection Formed on Sticks Notched to Permit Easy Bending or Breaking of Sticks in Case Undue Force is Applied on Handle Portion While Confection is Held in Mouth—Edward E. Cahoon, Racine, Wis. No. 2,211,197. Aug. 13, 1940.

Juice Boiling Out of Berry Pies During Baking Caught in a Circular Drip-pan Attachment—Marguerite Enos, Jerseyville, Ill. No. 2,211,261. Aug. 13, 1940.

Natural Color of Fruit Intensified by Treatment of Fruits or Peel With a Wax-like Carrier Containing an Oil-soluble Dye After the Fruit Has Been Washed Free of Natural Wax-like Covering—Jagan N. Sharma, Riverside, Calif., to Food Machinery Corp., San Jose, Calif. No. 2,211,390. Aug. 13, 1940.

Bread Loaf Sliced and Separated Into Fractional Portions by Mechanical Means For Wrapping—Gustav C. Papendick, University City, Mo., to Papendick, Inc., St. Louis, Mo. No. 2,211,433. Aug. 13, 1940.

Eggs, Milk and Shortening Made Into a Moist Composition and Mechanically Treated at Less Than Sterilizing Temperature Level for Storage in Preserved State Without Refrigeration—William R. Voss, Milwaukee, Wis. No. 2,211,678. Aug. 13, 1940.

Fruit Diced by Mechanical Means on an Industrial Volume Basis—Frank A. Wool, San Jose, Calif. No. 2,211,919. Aug. 20, 1940.

Corn Kernels Cut From Cob by Mechanical Means—William W. Morral and Samuel E Morral, Morral, Ohio. No. 2,212,071. Aug 20, 1940.

Carbonated Beverage Ingredients Given a Mechanical Mixing During Bottling Operating—George L. N. Meyer, Milwaukee, Wis No. 2,212,325. Aug. 20, 1940.

Egg Whites Treated to Produce a Uniform, Fine-flocculated, Easily Dispersed Final Product Upon Drying—Verne D. Littlefield, Beverly Hills, Calif., and Norman C. Fischer Springfield, Mo., to Armour & Co., Chicago Ill. No. 2,212,445. Aug. 20, 1940.

Sliced Potatoes Having a High Sugar Content Soaked in a From 0.1 to 0.7 Percent Acid Solution for From 5 Minutes to 5 Hours to Give a Uniformly Colored and Palate-appealing French-fried Potato—Keith T. Swartz, Chicago, Ill., to Continental Can Co., Inc., New York, N. Y. No. 2,212,461 Aug. 20, 1940.

Chocolate Liquor Roasted Following the Grinding of Cocoa Bean Nibs With the Evolution of Frictional Heat and Refined While in Heated State—Albert A. Lund, Port Washington, N. Y. No. 2,212,544. Aug. 27, 1940.

Acid-precipitated Casein Treated With a Dilute Solution of Ammonia in the Presence of a Finely Divided Paint Pigment as a Step in Making Dried Casein Paint—Walter B. Kinney, Bainbridge, N. Y., to Borden Co., New York, N. Y. No. 2,212,566. Aug. 27, 1940.

Fruits Having a Circular Cross Section and a Central Bore Cut into a Plurality of Portions by Mechanical Means—Eugene Robert Jagenburg, Brooklyn, N. Y. No. 2,212,605 Aug. 27, 1940.

Fresh Fruit Given a Surface Coating of Wax From a Solution in Such a Manner that the Volatile Organic Solvent is Removed Without Burning Surface of Fruit—Jagan N. Sharma, Los Angeles, Calif., to Food Machinery Corp., San Jose, Calif. No. 2,212,621. Aug. 27, 1940.

Biscuits of Soft, Sticky Dough Molded and Handled by Mechanical Means — Otto Kremmling, Hamersleben, Germany. No. 2,212,743. Aug. 27, 1940.

Juice Expressed From Citrus Fruit While Passing Through a Horizontal Machine Equipped With a Convex Rubbing Burr Mating Axially With a Grooved Forward Carrying Roll—Ralph Polk, Sr., Miami, and Ralph Polk, Jr., Haines City, Fla., to the Polk Development Co., Tampa, Fla. No. 2,212,925. Aug. 27, 1940.

Liquid Milk Cultured With Lactic Acid Bacteria and Homogenized Preliminary to Drying to Powdered Form—Ninni Maria Kronberg, Rydsgard, Sweden, to Svenska Mjolkprodukter Aktiebolag, Stockholm, Sweden. No. 2,213,283. Sept. 3, 1940.

Fluid Foodstuff Cooled by an Evaporative Cooling System Functioning as a Closed Circuit—Fred H. Wagner, Jr., to Niagara Blower Co., New York, N. Y. No. 2,213,421. Sept. 3, 1940.

Sugar Cones Made by a Self-contained Unit Which Mechanically Supplies the Batter to the Shaping and Baking Element—Robert A. Yohai and Harry G. Tatosian, to Sugar Shell Corp., New York, N. Y. No. 2,213,727. Sept. 3, 1940.

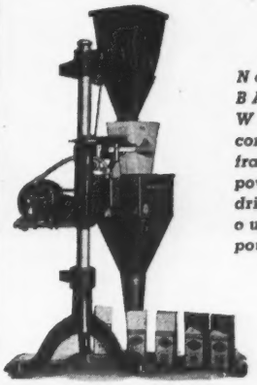
Chocolate and Cocoa-containing Pastes Aerated During Congeing—Richard Goll, Dresden, Germany. No. 2,213,811. Sept. 3, 1940.

Chocolate-coated Confection Shaped in a Double-walled Molding Form by Exhausting the Enclosed Area and at the Same Time Sucking the Material to be Shaped Into the Mold Recesses—Theodor Daniels, Wevelinghoven, Rhineland, Germany. No. 2,213,902. Sept. 3, 1940.

Glass Milk Bottle Given a Special Top Finish to Prevent Dripping During Pouring of Milk—Harry L. White, Melrose, and John Arthur Keenan, Newton, Mass., to General Ice Cream Corp., Schenectady, N. Y. No. 2,214,004. Sept. 10, 1940.

EDTBAUER-DUPLEX

Automatic Net Weighers



No. A2 EDTBAUER NET WEIGHER, complete with fractional horsepower motor and drive. Capacity 4 ounces to 3 pounds.

Edtbauer-Duplex Automatic Net Weighers are capable of delivering accurate weights of dry, powdered or granular materials. Fast, dependable and easy to operate. Made in five sizes with capacities ranging from several ounces to seventy-five pounds per discharge. Two models —Gravity Feed for free flowing products and Power Feed for non-free flowing materials. Let Edtbauer economy help lower your packaging costs. Write to:—

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Established 1872

454 S. CLINTON ST., CHICAGO, ILL.

1878

NEW YORK'S FIRST TELEPHONE DIRECTORY

GOES INTO SERVICE

1878 *Chas. Pfizer & Co., then twenty-nine years old, proved its progressive spirit by being one of the 241 subscribers listed in New York's one-page, earliest telephone directory.*

¶ Chas. Pfizer & Co., founded in 1849, engaged first in the refining of santonine. By 1878, the Pfizer line included the leading iodine, mercury and bismuth preparations, boric acid and borax, tartar products and other chemicals, also the refining of camphor. The firm had already established a reputation for quality products, manufactured according to their high standards of purity and uniformity.

¶ Pfizer products have multiplied both in number and volume since 1878. Today they serve a vastly greater market. But Chas. Pfizer & Co. has not changed in its rigid adherence to highest standards of quality. And Pfizer's progressive spirit is more in evidence today than ever, as the Pfizer laboratories constantly evolve new ways to meet the growing needs of modern industry.

CHAS. PFIZER & CO., INC.

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MANUFACTURING CHEMISTS SINCE 1849

Formulas for Foods

FORMULA NO. 129

Whole Strawberries

Strawberries (cold packed 2 plus 1) 1 bbl.	50 gal.
Sugar (sucrose) equal to ½ weight of drained fruit	
Strawberry red color	8 oz.
Japanese gelatine (in 1 gal. water)	6 oz.
Benzoate of soda (in 1 qt. water)	8 oz.
Genuine fruit extract, strawberry	8 oz.
Fruit acid	8 oz.

Working Directions

Drain juice from fruit and weigh the fruit. Place drained fruit in kettle. Add sugar to the amount of half the weight of the drained fruit. Then add color and benzoate of soda, dissolved in water. Heat the Japanese gelatine separately in a gallon of water to dissolve it. Then add it to the fruit, etc., in the kettle. Heat contents of kettle to 180 deg. F. Draw into cooling pan, and add extract and acid when cool.

Formula from David Algic

FORMULA NO. 130

Pilot Bread

(New England Type)

Sponge

Flour (straight soft winter)	49 lb.
Water	4 gal.
Yeast	10 oz.

Break up yeast in lukewarm water, about 90 deg. F. Stir in flour to give a uniform mix. Ferment for 16 hours at 80 deg. F.

Dough

To sponge add:

Flour (straight soft winter)	735 lb.
Flour (patent soft winter)	196 lb.
Salt	7½ lb.
Lard	60 lb.
Soda	2 lb.
Water	38 gal.

Break lard up in sponge and dissolve salt in water. Add soda with flour and mix to give a well mixed and light dough. Ferment for 4 hours at 80 deg. F. Run through break roll twice and sheet into a thick cracker dough. Cut on a cracker machine using a circular cutter 5½ in. in diameter. Make as little scrap as possible. It does not rework well. Bake in a cracker oven at about 600 deg. F. for 5 minutes; 500 deg. F. for 10 minutes.

After baking, dry thoroughly in hot room before packing in airtight containers for export or on-board-ship use. For local or quick use, wooden barrels, paper cartons or bags, may serve.

Formula from Technical Institute of Independent Biscuit Mfgrs. Co., Inc.

FORMULA NO. 131

Fudge

Ingredients	No. 1 Chocolate	No. 2 Vanilla	No. 3 Vanilla
	Weight of ingredients (either grams or oz.)		
Sugar	630	.....	.....
Corn sirup (80 percent)	270	360	360
Invert sirup (80 percent)	180	180	180
Coconut fat (m.p., 110 deg. F.)	135	135	135
Butter fat (as butter or as cream)	.....	135	135
Sweetened condensed whey	2,707	3,510	3,500
Whey solids 40 percent Sugar 40 percent			
Water	200	.....	.....

Cook to 249.8 deg. F., then draw from kettle. Add:

Corn sirup	270	360	360
Fondant (approx. 11 percent water)	1,350	1,350	350
Corn sirup Sugar			
Sweetened condensed whey	.....	.....	1,125
Whey solids 40 percent Sugar 40 percent			
Chocolate	290	.....	.....
Powdered lactose	5	5	.....
Vanilla — to flavor			
Total	6,037	6,035	6,145

Working directions

Cook, with stirring, the first group of ingredients. Temperature to reach will vary from 246 to 250 deg. F., depending on the body desired.

After cooking, cool without stirring to about 167 deg. F. Then stir in the second group of ingredients. Continue stirring and cooling for a few minutes but not until the viscosity of the mass becomes too great for easy handling. Pour the fudge quickly into wooden forms and hold overnight in a warm room.

Formula from B. H. Webb and C. F. Hufnagel, Bureau of Dairy Industry, U. S. Department of Agriculture, Washington, D. C.

FORMULA NO. 132

Cream-type Icing Stock

This formula has been developed to avoid the stickiness of many icings.

Butter	2 lb. 8 oz.
Hydrogenated shortening	5 lb. 4 oz.
Water	10 lb. 6 oz.
Sugar (powdered 4X)	50 lb. 0 oz.
Salt	0 lb. 8 oz.
Dry milk solids [1]	10 lb. 6 oz.

[1] Not over 1½ percent fat content.

Blend butter and shortening thoroughly at 75 deg. F. Add water carefully with slow-speed beating to make an emulsion. Blend sugar, salt and dry milk solids thoroughly and add gradually to emulsion. Cream well.

Desired variations may be had by adding various flavorings, colorings, fruits or nuts to this icing stock.

Formula from American Dry Milk Institute, Inc.

FORMULA NO. 133

Butter Cream Icing A

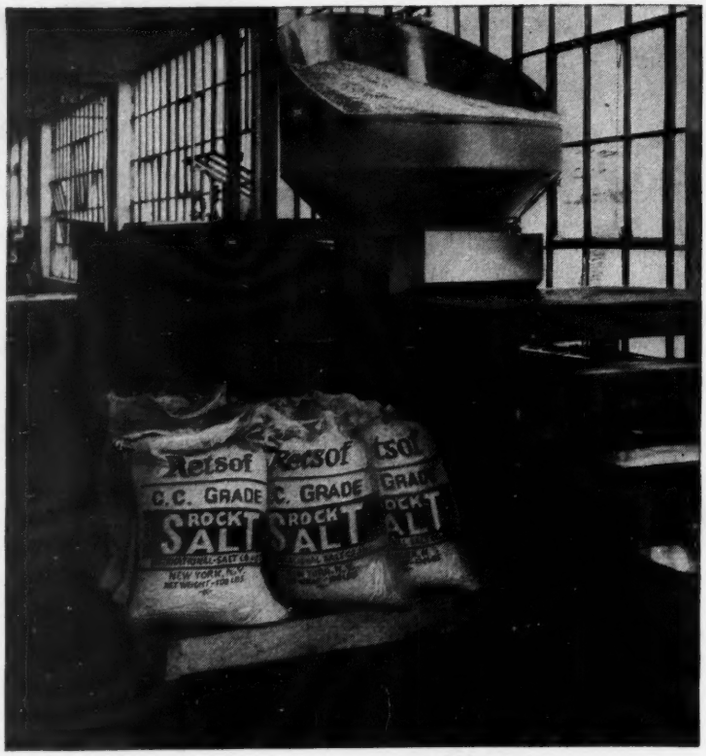
Butter	0 lb. 12 oz.
Hydrogenated shortening	2 lb. 6 oz.
Water	2 lb. 4 oz.
Sugar (powdered 4X)	12 lb. 8 oz.
Dry milk solids [1]	3 lb. 12 oz.
Vanilla extract	to suit
Egg whites	0 lb. 12 oz.

[1] Not over 1½ percent fat content.

Blend fats well at 75 deg. F. Add water carefully with slow-speed beating to make an emulsion. Sift sugar and milk solids several times and add gradually to mix. Beat smooth. Add

Lixate Brine

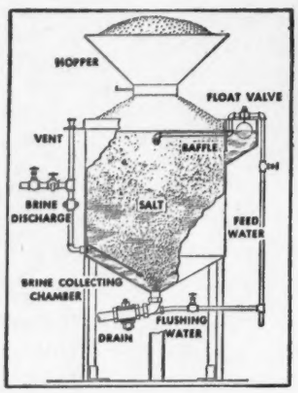
an important step in the long march towards better foods at *lower costs*



THE FISH PACKING DEPARTMENT
of a large chain store organization

The Lixate installation above is in the fish department of a large chain store organization, where Lixate Brine is used for packing the quality brands of the company. Lixate Brine is used for packing fish and shrimp; meats; for brining cauliflower; for pickles and olives; for quality grading of peas, beans, corn and sesame seed by the specific gravity method; for every food packing operation where salt brine is now used or can be used.

ONCE it was a miracle for the housewife to pick out-of-season foods from her pantry shelf. Today it is a common-place, and the consumer insists that canned and preserved foods look and taste like the fresh products of orchard and garden, fishery and meat packing plant. In the long march towards better texture, taste and tenderness in preserved foods, Lixate Brine has helped the food industries in many important ways.



This modern brine, produced automatically, is crystal clear, bacteriologically clean and chemically pure far beyond pure food requirements. This makes it ideal for brining and preserving fruits, vegetables, meats and sea foods. This same high quality makes it ideal for the "flotation" method of grading legumes, or for use in quick freezing or other refrigeration processes where salt brine is used.

Above all, Lixate Brine provides this better quality with important economies, of which the following are most important:

1. Lower cost for handling salt.
2. No labor or power costs for making brine.
3. Major savings by piping brine throughout the plant instead of carrying or trucking bags and boxes of salt or barrels of brine.
4. Savings of 10% to 20% in amount of salt required.

These savings are made by the automatic operation shown in this diagram. The proper grade of International's Rock Salt is placed in the hopper, and flows by gravity to the Lixator below. Water enters through a spray nozzle at the top, dissolves the salt without agitation, and becomes fully saturated brine. Brine, self-filtered to be crystal clear, rises in the collecting chamber to a discharge pipe and flows to a storage tank. For more details, write for a free copy of the informative and useful Lixate Book.

★ ★ ★

• SALT FOR EVERY PURPOSE

International Salt Company, Incorporated, which developed The Lixate Process, produces every type and grade of salt for every industrial process. All grades of granulated salt (vacuum evaporated); flake salt (grainer evaporated); and Rock Salt, are available from three modern refining plants and three great mines. The Research Department of International Salt Company, Incorporated, shares its knowledge of salt uses freely and without cost, with all who use salt and salt brine in industry.

• WRITE FOR THIS BOOK

A copy of The Lixate Book will be sent on request. It not only contains a detailed explanation of The Lixate Process, and illustrations of many installations, but it also gives detailed information concerning properties of salt brine. It should be in every food packing executive's library.

The **LIXATE** *Process*
REG. U. S. PAT. OFF.
for making brine

INTERNATIONAL SALT COMPANY, Inc., SCRANTON, PA.

SALES OFFICES: *New York, N. Y. • Buffalo, N. Y. • Philadelphia, Pa. • Boston, Mass. • Baltimore, Md. • Pittsburgh, Pa. • Newark, N. J. • Richmond, Va. New Orleans, La. • Cincinnati, O. • St. Louis, Mo.*
REFINERIES: *Watkins Glen, N. Y. • Ludlowville, N. Y. • Avery Island, La.* • MINES: *Retsof, N. Y. • Detroit, Mich. • Avery Island, La.*

"HEALTHIER" SALES
when you add
CRYSTALLINE B1 WINTHROP
TO REPLACE LOST VITAMIN POTENCY
Food products should be "true to Nature." In their natural state, many food ingredients contain nutritionally important amounts of vitamin B1—which are not retained in the finished product because of necessary processing. If this is true of your products, restoration of full natural vitamin B1 potency with "Crystalline B1 Winthrop" is recommended for the health and sales advantages it provides.

ALONG THE WAY to the consumer's table, many fine manufactured foods lose, through necessary processing, much of the valuable vitamin B_1 content originally put into the ingredients by a wise Mother Nature.

Doctors and nutritional authorities deplore this loss. Consumers are aware of it — awake to the deficiency of vitamin B_1 in their average diet. So more and more, food manufacturers are realizing the many sales advantages gained when *natural* B_1 potency is restored to their products.

This now is easily accomplished with the aid of "Crystalline B_1 Winthrop." By using ingredients — white flour, for instance — to which "Crystalline B_1 Winthrop" has been added, or by its direct use in your own plant, it is both practical and profitable to replace the full vitamin B_1 value lost in processing.

"Crystalline B_1 Winthrop" has no effect on odor, color, taste or bulk; does not complicate production problems. Information and price schedules covering both "Crystalline B_1 Winthrop" and Vitamin C (ascorbic acid) sent on request. Write for them today.

WINTHROP

VITAMIN B1

(THIAMINE HYDROCHLORIDE U. S. P.)

SPECIAL MARKETS DIVISION

WINTHROP

CHEMICAL COMPANY, INC.

170 VARICK STREET, NEW YORK, N. Y.

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You'll Find

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- **MELOJEL** is a new, improved processed Corn Starch with many distinctive and outstanding properties never before obtainable in Corn Starch.
- **MELOJEL** offers controlled "jell," with exceptional stability; unvarying uniformity; unusual smoothness; and improved flavor, for **MELOJEL** is remarkably free from cereal taste.
- **MELOJEL** is unsurpassed for Pie Fillings and Dessert Preparations; as a bodying agent for Salad Dressings; for use in Soups, Gravies, Ice Cream Cones, or any food product in which starches are used.

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We shall be glad to send you a generous free working sample, or a trial 100-lb. bag on approval, if you will give us the full facts regarding the type of product in which you want to use it. With the facilities of our Laboratory and Food Kitchen, we are equipped to give you valuable information for using **MELOJEL** to your best advantage.

NATIONAL STARCH PRODUCTS INC.

818 GREENWICH STREET, NEW YORK

vanilla flavor. Beat egg whites stiff and fold in. Mix until smooth.

If chocolate flavor and color are desired, add 1 oz. of natural or "domestic" cocoa powder for each 15 oz. of butter cream icing stock used. Mix on low speed to get uniformity in mix.

Formula from American Dry Milk Institute, Inc.

FORMULA NO. 134

Ginger Extract

Ginger root	**2 lb.**
Grain alcohol (190 proof)	**1 gal.**
Water	**1 qt.**

Chop the root and pack into a percolator in the usual manner. (Chopped root is preferable to ground or powdered root for satisfactory percolation.)

To pack a percolator, put excelsior in the bottom or neck and cover it with a layer of filter material such as cotton. Then pack in the chopped root. Macerate by covering with the liquid for two days. (To macerate is to soak or steep.) Drain off the extract. Repeat the maceration. Drain off the second extract. Now add the remaining solvent (mixture of alcohol and water) to wash out the extractives remaining in the root. This last lot is known as the "drivings." Mix drivings and two extractions together.

Formula from Davie Algie

FORMULA NO. 135

Peanut Brittle No. 1

Sugar (white granulated)	**15 lb.**
No. 1 Spanish peanuts (raw)	**10 lb.**
Dairy butter	**8 oz.**
Salt (powdered or extra fine)	**2 tablespoonful**
Soda (optional)	**1 pinch**

Be sure sugar is free from lumps and not extra dry. Ordinary commercial sugar is satisfactory.

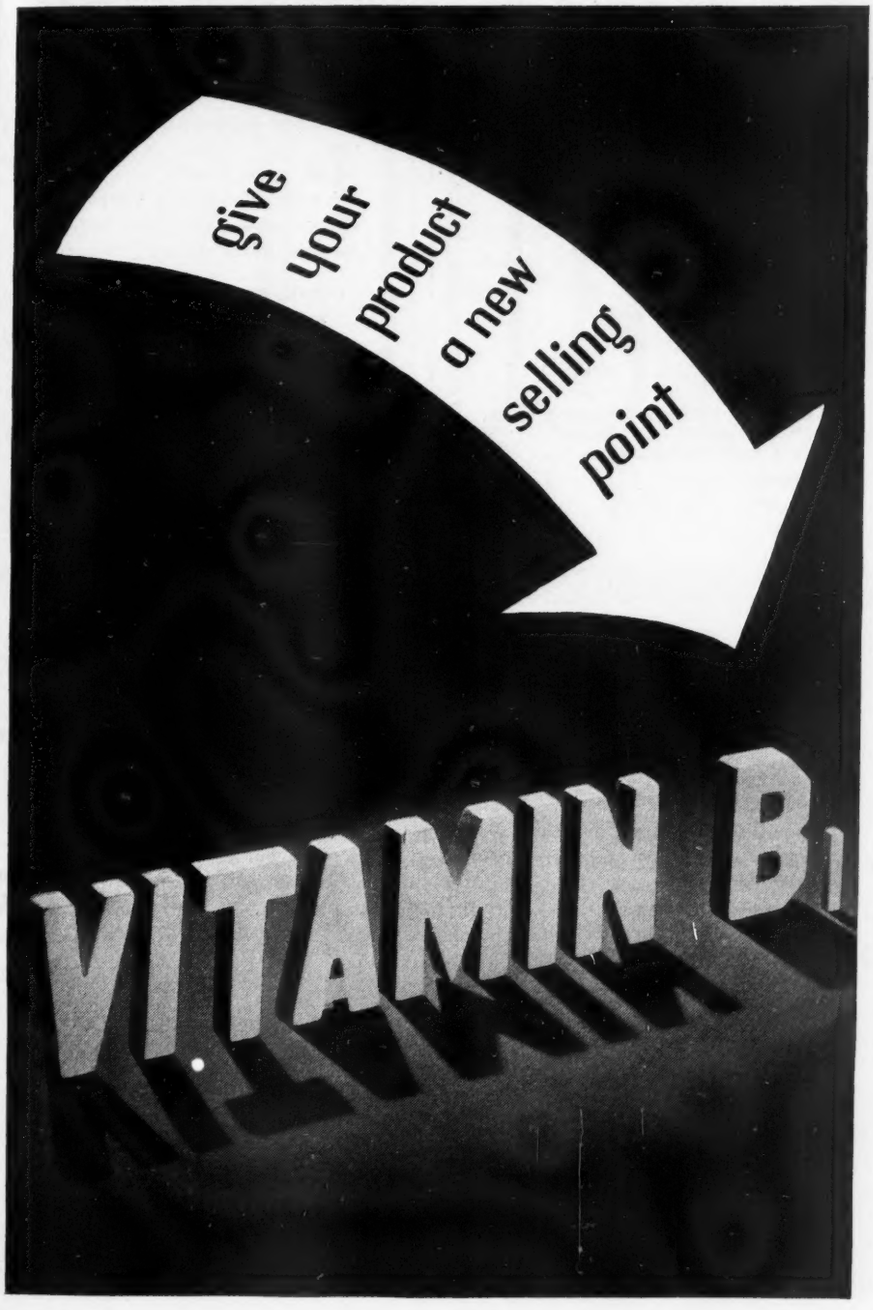
Place sugar in copper cooking pan over open gas fire and stir continuously until it melts.

Remove from fire, stir in the peanuts.

Return to fire and stir until peanuts turn slightly brown. Remove from fire and continue stirring until peanuts are well roasted. If necessary, to get peanuts roasted to desired degree, place pan on fire again for few seconds. Stir well but not too vigorously.

When peanuts are sufficiently roasted, add the butter and the salt, and turn the batch out on an oiled marble or bright cooling surface. Allow to cool a few minutes. Turn edges of

FOR GREATER SALES



The addition of vitamin B_1 to foods that have lost this important dietary essential through processing has the endorsement of eminent nutritional authorities. With vitamin B_1 now commercially available in pure crystalline form, troublesome problems of color, odor, taste, and bulkiness are completely eliminated.

We suggest that you call us in today and learn how easily and economically vitamin B_1 can be incorporated in your product.

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Other pure crystalline vitamins manufactured by Merck are:

Riboflavin (Vitamin G)
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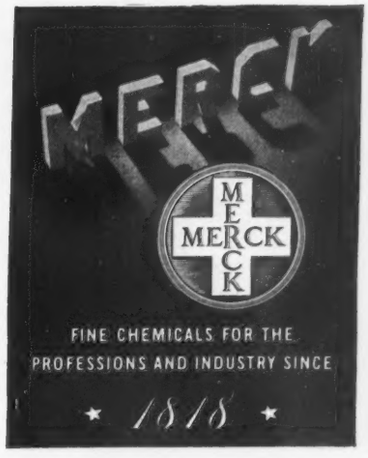
Nicotinamide Vitamin B_6

Our scientific staff and laboratories are prepared to serve you.



The progressive food manufacturer will be quick to grasp the tremendous opportunity for realizing increased sales through fortification of his product with vitamin B_1. Consumers today are more vitamin-conscious than ever before, and the manufacturer who improves his product with vitamin B_1 will add a new, sales-compelling appeal.

MERCK & CO. Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

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EFF-BEE Essentials

What is "CONTROLLED" Seasoning?

"CONTROLLED" seasoning is a more efficient flavoring technique for food manufacturers. It is a simplification over the use of dry herbs and spices in that it employs *controlled quality* essential oils and oleoresins in proper blend to produce any desired taste effect. Once this blend has been established, its exact duplication, from then on, is a mere matter of accurate measuring. A finer, more stable and much more uniform flavor is the ultimate result.

This is most important to food packers whose products have a quality flavor appeal,—packers and manufacturers, for example, of meat and sausage products, of catsups and pickled goods, of mince meats, puddings, pie fillers and others too numerous to mention.

The success of "controlled" seasoning hinges upon two conditions: 1) The use of dependable basic materials; 2) The proper proportioning of ingredients for any desired effect. In using Fritzsche Brothers' materials, "controlled" seasoning becomes dependable because F.B. "controlled" Spice Oils are dependable. These Oils are controlled from original source to pure, full-flavored, finished product. This assures absolute uniformity and quality of flavor at all times. In availing himself of the experience of Fritzsche's compounding specialists, the manufacturer acquires an exclusive flavor blend in precise accord with his individual taste and cost requirements. That the Fritzsche method of "controlled" seasoning is here to grow and to stay is indicated by its continuously increasing application. Our Flavoring Division will be glad to show how it can bring uniform flavor quality and improved profit margin to your products. Please address us on your letterhead.

FRITZSCHE BROTHERS, Inc.
PORT AUTHORITY COMMERCE BLDG., 76 NINTH AVENUE, NEW YORK, N. Y.
BOSTON CHICAGO LOS ANGELES ST. LOUIS TORONTO, CANADA MEXICO, D. F.

mass into batch and fold to keep nuts and molten sugar uniformly mixed.

When cool enough to handle with cloth-gloved hands, divide batch into 3- to 4-lb. portions. Roll each portion out with a rolling pin; if made of steel do not have it heavy enough to crush the peanuts. Roll and stretch by pulling with hands until sheet becomes quite thin.

Let lie on cooling slab until thoroughly cold before packing.

An assistant should be used to keep cooking and operations moving along rapidly. Burning of sugar during melting must be avoided. Rapid rolling out of portions is essential.

When soda is used, it should be stirred in well just before mass is turned out on cooling slab. It makes the brittle slightly fluffy.

FORMULA NO. 136

Worcestershire Sauce No. 5

West Indian tamarinds	20 lb.
Limes	10 lb.
Shallots	2½ lb.
Garlic	2½ lb.
Sugar	10 lb.
Salt	5 lb.
Ginger	2 lb.
Cayenne pepper	12 oz.
Soy sauce	2 gal.
Cassareep juice	2 gal.
Vinegar (24 grain)	14 gal.

Boil the tamarinds with 6 gal. of the vinegar and pass through a pulping machine.

Dissolve the sugar in 5 gal. of the vinegar by boiling and pass through a fine sieve.

Place all the ingredients in a pan (steam-jacketed kettle) and simmer for an hour.

Then pass through a flat stone mill, followed by a fine sieve.

Formula from H. B. Cronshaw, London, England

FORMULA NO. 137

Bologna No. 1

Bull meat	35 lb.
Beef trimmings	30 lb.
Regular pork trimmings	20 lb.
Beef cheeks	15 lb.
Dry milk solids	3½ lb.
White pepper	6 oz.
Allspice	2 oz.
Onion powder	½ oz.
Garlic powder (optional)	½ oz.
Coriander	1 oz.
Salt	3 lb.
Quick cure (Formula No. 52)	1 qt.

For large bologna stuff in beef bungs or bung size artificial casing.

See also General Directions (Formula No. 22).

Formula from American Dry Milk Institute

"D & O" SPICEOLATE FLAVORS

offer distinct advantage over dry spices and oils because they are more soluble and the absorbtion ratio is therefore greater. The flavor value compares favorably with the essential oils and the cost is about the same.

In all spice flavors and mixed for every flavoring requirement. Also made up for private formula mixtures.

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MATERIALS FOR THE FOOD MANUFACTURER

Many of these materials are advertised in this issue under the heading—MATERIALS FOR THE FOOD MANUFACTURER.

There is an index to Raw Materials advertised in this issue on page 108.